LOAN DOCUMENT

PHOTOGRAPH THIS SHEET

DTIC ACCESSION NUMBER

LEVEL

INVENTORY

DoD Corporate Information Management +
Enterprise Integration Proceedings.

DOCUMENT IDENTIFICATION

14 Dec 94

DISTRIBUTION STATEMENT

H A N D L E   W I T H   C A R E

ACCESSION FOR

NTIS	GRA&I	☑
DTIC	TRAC	☐
UNANNOUNCED		☐
JUSTIFICATION		

BY

DISTRIBUTION/

AVAILABILITY CODES

DISTRIBUTION	AVAILABILITY AND/OR SPECIAL
A-1	

DISTRIBUTION STAMP

DATE ACCESSIONED

DATE RETURNED

19950426 063

DATE RECEIVED IN DTIC

REGISTERED OR CERTIFIED NUMBER

PHOTOGRAPH THIS SHEET AND RETURN TO DTIC-FDAC

DTIC FORM 70A
JUN 90

DOCUMENT PROCESSING SHEET

PREVIOUS EDITIONS MAY BE USED UNTIL
STOCK IS EXHAUSTED.

LOAN DOCUMENT

DTIC QUALITY INSPECTED 5

DEPARTMENT OF

DEFENSE'S

CORPORATE INFORMATION

MANAGEMENT

AND

ENTERPRISE INTEGRATION

PROCEEDINGS

13-14 December 1994
Reston, VA
Event #574

supported by
THE AMERICAN DEFENSE PREPAREDNESS ASSOCIATION

DRAFT SF 298

1. Report Date (dd-mm-yy) 14-12-94	2. Report Type Proceedings	3. Dates covered (from... to) N/A	
4. Title & subtitle Department of Defense's Corporate Information Management and Enterprise Integration Proceedings		**5a. Contract or Grant #**	
		5b. Program Element #	
6. Author(s)		**5c. Project #**	
		5d. Task #	
		5e. Work Unit #	

7. Performing Organization Name & Address The American Defense Preparedness Association Alexandria, VA	8. Performing Organization Report #
9. Sponsoring/Monitoring Agency Name & Address AST SEC OF DEF CMND CNTRL COMMCTN AND INTELL 6000 Defense Pentagon Washington, DC 20301-6000	10. Monitor Acronym OASD (C3I)
	11. Monitor Report #

12. Distribution/Availability Statement   Unclassified/Unlimited

13. Supplementary Notes

14. Abstract   This document contains the presentations and speeches from the DoD Corporate Information Management and Enterprise Integration Symposium. The symposium was held in Reston, Virginia on December 13-14, 1994. It includes speeches and presentations from the Honorable Emmett Paige, Jr., Assistant Secretary of Defense (C3I), Lt Gen Albert Edmonds, USAF, Director, Defense Information Systems Agency (DISA), Ms. Cynthia Kendall, Deputy Assistant Secretary of Defense (IM), MG James Klugh, USA (ret.), Deputy Undersecretary of Defense (Logistics), Maj Gen George Anderson, M.D., USAF, MC, Deputy Assistant Secretary of Defense (Health Services Operations & Readiness), and Mr. Richard Keevey, Deputy Undersecretary of Defense (Comptroller/Financial Management). The Corporate Information Management and Enterprise Integration Initiatives cover the areas of Business Process Reengineering, Data Administration, Migration Systems, and Computer and Communication Infrastructure.

15. Subject Terms CIM (Collection)

Security Classification of			19. Limitation of Abstract	20. # of Pages	21. Responsible Person (Name and Telephone #)
16. Report Unclassified	17. Abstract Unclassified	18. This Page Unclassified	Unlimited	242	Dave Norem ASD/C3I 703-604-1573

TABLE OF CONTENTS

KEYNOTE ADDRESS

BY

THE HONORABLE EMMETT PAIGE, JR.

ASSISTANT SECRETARY OF DEFENSE

COMMAND, CONTROL, COMMUNICATIONS

AND INTELLIGENCE

WASHINGTON, DC

TO THE

AMERICAN DEFENSE

PREPAREDNESS ASSOCIATION

CORPORATE INFORMATION MANAGEMENT

AND ENTERPRISE INTEGRATION

SYMPOSIUM

HYATT REGENCY HOTEL

RESTON, VIRGINIA

DECEMBER 13, 1994

GOOD MORNING! THANK YOU, MS. RAND, YOUR WARM WORDS OF INTRODUCTION, AND THANKS ALSO GOES TO THE AMERICAN DEFENSE PREPAREDNESS ASSOCIATION FOR HOSTING THIS MEETING.

THIS SYMPOSIUM BRINGS TOGETHER A DIVERSITY OF INTERESTS IN CORPORATE INFORMATION MANAGEMENT AND ENTERPRISE INTEGRATION. IT ALSO BRINGS TOGETHER A WEALTH OF EXPERIENCE AND A WIDE RANGE OF OPINIONS ABOUT ACTIONS THAT HAVE TAKEN PLACE AND THOSE THAT ARE ON THE HORIZON.

I WANT THE BOTTOM LINE OF THIS SYMPOSIUM TO BE ACTION. I COULD STAND HEAR AND GIVE YOU QUOTES AND PLATITUDES, AND ALL THAT MIGHT BE INTELLECTUALLY ENLIGHTENING, BUT THAT'S NOT WHAT'S GOING TO GET THE JOB DONE.

BEFORE I GO TOO FAR WITH THIS, LET ME TELL YOU IN A FEW STATEMENTS WHAT I HAVE TO SAY: AFTER THAT I WILL GET MORE SPECIFIC ABOUT ACTIONS AND GIVE YOU A LITTLE MORE GRIST FOR THE MILL.

I'D LIKE TO SHARE WITH YOU MY MODE OF OPERATION FOR GETTING THINGS DONE. AFTER YOU REALIZE THAT SOMETHING NEEDS TO BE DONE AND THAT YOU HAVE GATHERED AN ADEQUATE AMOUNT OF INFORMATION, THEN YOU MAKE A DECISION. YOU LATCH ONTO SOMETHING, AND HAVE THE STAYING POWER AND PERSEVERANCE TO MAKE IT SUCCESSFUL.

IF THERE IS A NEED FOR COURSE ADJUSTMENTS, YOU DO SO IF THERE IS A COMPELLING REASON. OTHERWISE YOU STAY THE COURSE AND WEATHER THE STORMS OF THE NAYSAYERS.

I CAME BACK TO THE DEPARTMENT OF DEFENSE ON A MISSION. I WOULD SUGGEST THAT YOU JOIN ME -- BUT THIS IS NOT FOR THE FAINT OF HEART OR THE WEAK OF EGO. IT TAKES A LOT OF STRENGTH OF CHARACTER TO BE ABLE TO LEAD AS NEEDED AND TO BE ABLE TO PLAY THE SUPPORTIVE ROLE WHEN THAT NEED ARISES.

WE HAVE ALL GATHERED HERE TO PULL TOGETHER TO GET ON WITH THE IMPLEMENTATION OF CORPORATE INFORMATION MANAGEMENT AND BRING ABOUT ENTERPRISE INTEGRATION. AS THE POET ROBERT FROST TOLD US, WE HAVE PROMISES TO KEEP AND MILES TO GO BEFORE WE SLEEP.

WHAT ARE THE MILES? ACTUALLY, THE DISTANCES COULD BE MEASURED IN MICRONS OR LESS. HOW FAR OFF MUST AN ELECTRON BE TO CAUSE A MISMATCH IN TARGETING INFORMATION? TO CAUSE THE NONPAYMENT OR THE OVERPAYMENT ON A CONTRACT? TO NOT UPDATE A MEDICAL RECORD BEFORE AN UNEXPECTED EMERGENCY?

THERE ARE ANY NUMBER OF EMOTIONALLY CHARGED EXAMPLES I COULD USE, BUT WE NEED NOT RUN ON FEELINGS. WE MUST RUN ON FACTS AND THE NEED TO MEET MISSION DEMANDS AND ON PLANS THAT LAY OUT REAL ACTIONS.

I APPLAUD THE AMERICAN DEFENSE PREPAREDNESS ASSOCIATION FOR BRINGING US ALL HERE. ALL THE MAJOR STAKEHOLDERS IN CIM AND ENTERPRISE INTEGRATION ARE HERE OR ARE REPRESENTED HERE TODAY.

FIRST, THERE ARE THE MILITARY SERVICES, WHO, I SUBMIT, MUST BE OUR MOST IMPORTANT STAKEHOLDERS. THE NEEDS OF OUR FIGHTING FORCES MUST REMAIN PARAMOUNT.

THIS IS NOT HERESAY AGAINST DEPARTMENTAL EFFORTS IN CIM BEING HEADED BY THE FUNCTIONAL LEADERSHIP WITHIN THE OFFICE OF THE SECRETARY OF DEFENSE. I BELIEVE THAT THIS IS THE BEST CONFIGURATION FOR PROVIDING SUPPORT FOR OUR TROOPS.

SO WHAT OF THE FUNCTIONS? WHICH IS MORE IMPORTANT THAN THE OTHERS? IS IT THE COMMAND AND CONTROL FUNCTION? THE INTELLIGENCE FUNCTION THAT GIVES EYES AND EARS TO OUR FIGHTING FORCES? IS IT THE ACQUISITION FUNCTION TO PROVIDE WEAPONS, BOMBS, BULLETS, SPARE PARTS AND SUPPLIES? IS IT THE FINANCIAL FUNCTION THAT PAY THE TROOPS AND TRANSLATES TAXPAYER DOLLARS INTO DEFENSE CAPABILITIES? IS IT PERSONNEL AND READINESS, THAT RECRUITS OUR FORCES, ASSIGNS THEM TO UNITS, AND TAKES CARE OF THEIR FAMILIES AS IT DEPLOYS THEM TO ALMOST ANY LOCATION ON THE GLOBE?

I ASSURE YOU, THERE IS NO FUNCTION EITHER MORE OR LESS IMPORTANT THAN ANY OTHER. <u>THOSE OF US WHO HAVE BEEN ASKED BY THE PRESIDENT TO MAINTAIN AND MAKE OUR FIGHTING FORCES THE BEST TRAINED, BEST EQUIPPED, BEST PREPARED IN THE WORLD ARE WORKING TOGETHER AS A TEAM</u>.

AS MOST OF YOU KNOW FROM HEARING MY THOUGHTS OVER THE YEARS, I CONSIDER ALL SYSTEMS TO BE COMMAND AND CONTROL SYSTEMS. I AM SURE THAT THE LEADERSHIP OF EACH FUNCTIONAL AREA ALSO VIEWS THEIR SYSTEMS AS COMMAND AND CONTROL SYSTEMS AS WELL.

USING THE CONCEPT OF JOINT OWNERSHIP, WE ARE JOINTLY RESPONSIBLE FOR THE SUCCESS OR FAILURE OF OUR FUNCTIONS AND SYSTEMS.

FROM MY PERSPECTIVE, OUR BUSINESS SYSTEMS WHICH ARE SOMETIMES REFERRED TO AS MANAGEMENT INFORMATION SYSTEMS ARE ESSENTIAL TO COMMAND AND CONTROL OF OUR FORCES.

WE HAVE BILLIONS OF LINES OF CODE IN THOSE SYSTEMS, AND THE COST OF MAINTAINING THOSE SYSTEMS IS JUST AS EXPENSIVE AS IT IS TO MAINTAIN THE CONVENTIONAL C3I SYSTEMS OR WEAPON SYSTEMS.

WE ARE TRYING TO REDUCE OUR SOFTWARE OVERHEAD AS WE MOVE AWAY FROM LEGACY SYSTEMS OF YESTERDAY AND ON TO MIGRATION SYSTEMS OF THE FUTURE, BUT THE SYSTEMS THAT REMAIN AS WE TRANSITION ALSO NEED ATTENTION.

THESE SYSTEMS MUST INTEROPERATE WITH THEMSELVES AND WITH OUR CONVENTIONAL C3 AND COMBAT SUPPORT SYSTEMS.

MUTUAL DEPENDENCY IS A FACT OF LIFE SO MUTUAL COOPERATION MUST BE ALSO. AS BENJAMIN FRANKLIN SAID AS HE SIGNED THE DECLARATION OF INDEPENDENCE, "WE MUST ALL HANG TOGETHER OR SURELY WE WILL ALL HANG SEPARATELY." THE DEPARTMENT OF DEFENSE MUST DRAW UPON THE STRENGTHS OF ITS DIVERSITY OF CAPABILITIES AND EXPERIENCE TO MAKE THE AMALGAM STRONGER AND MORE USEFUL THAN ITS INDIVIDUAL COMPONENT PARTS.

LET ME GIVE YOU AN EXAMPLE OF ONE OF THESE EFFORTS, ONE WHICH IS CUTTING TO THE CORE OF MANY OF OUR SYSTEMS PROBLEMS, THAT BEING THOSE BILLIONS OF LINES OF CODE THAT I JUST MENTIONED.

AS MOST OF YOU KNOW I STRONGLY BELIEVE WE HAVE A SOFTWARE CRISIS IN DOD. THE ASD(C3I) IS GENERALLY REGARDED AS THE PROPONENT FOR SOFTWARE POLICY WITHIN DOD WHILE

USD(A&T), AND SPECIFICALLY DDR&E, IS RESPONSIBLE FOR
SOFTWARE R&D.

NOEL LONGUEMARE, THE PRINCIPAL DEPUTY USD(A&T), AND I
CO-CHAIR THE SOFTWARE MANAGEMENT EXECUTIVE COUNCIL. WE
HAVE INITIATED A SOFTWARE MANAGEMENT REVIEW BOARD AND
PROCESS ACTION TEAMS.

I LIKE THE IDEA OF THE USD(A&T) FOLK, IN THEIR ROLE OF
OVERSIGHT FOR ALL THE WEAPONS SYSTEMS AND COMBAT SUPPORT
SYSTEMS, BEING INVOLVED IN THE DAY-TO-DAY SOFTWARE
BUSINESS. IN THE PAST, THEY HAVE BEEN IN THE R&D OF SOFTWARE
SUCH AS THEY WERE WITH ADA, BUT THEY HAVE NOT ENFORCED THE
USE OF THEIR PRODUCTS.

WHEN THE RESEARCH COMMUNITY IS DEALING WITH
SOFTWARE FOR A SPECIFIC WEAPON SYSTEMS, THEY ARE WORKING
LARGELY IN THE REALM OF APPLIED RESEARCH. IN ANY TYPE OF
RESEARCH, THERE ARE PARAMETERS THAT ARE HELD CONSTANT --
THESE ARE THE "GIVENS" -- AND THERE ARE ALSO PARAMETERS THAT
ARE ALLOWED TO VARY.

I ASSERT THAT THE SOFTWARE FOR WEAPON SYSTEMS SHOULD
BE DEVELOPED WITH AN EXPANDED SET OF "GIVENS."

MORE STANDARDIZATION OF SOFTWARE LANGUAGES, TOOLS, AND PROCESSES IN THE SYSTEMS DEVELOPMENT AREA WOULD YIELD SYSTEMS THAT WILL INTEROPERATE BETTER AND SAVE BILLIONS TO BUILD AND MAINTAIN OVER THEIR LIFE CYCLE.

THIS DEPARTMENT-WIDE SOFTWARE MANAGEMENT INITIATIVE COVERS ALL ASPECTS OF SOFTWARE MANAGEMENT AND ACQUISITION IMPROVEMENT, REGARDLESS OF THE USE OF THE SOFTWARE.

OUR SOFTWARE INITIATIVE COVERS IMPLEMENTATION OF THE MANAGEMENT IMPROVEMENTS AND RECOMMENDATIONS CONTAINED IN THE JUNE 1994 DEFENSE SCIENCE BOARD STUDY ON "ACQUIRING DEFENSE SOFTWARE COMMERCIALLY."

THE FIRST TWO PROCESS ACTION TEAMS HAVE ALREADY BEEN CONVENED ON SOFTWARE ACQUISITION BEST PRACTICES AND ON EDUCATION. ADDITIONAL TEAMS WILL BE FORMED AS NEEDED.

ADDITIONAL CROSS-FUNCTIONAL COOPERATION IS TAKING PLACE IN THE ACQUISITION ARENA. WHILE I BELIEVE THAT THE FEDERAL ACQUISITION STREAMLINING ACT WILL DO MUCH TO ALLEVIATE THE CUMBERSOME ACQUISITION PROCESS, THERE IS MUCH THAT WE CAN AND MUST DO OURSELVES.

THE RATE OF CHANGE IN TECHNOLOGY IS SO RAPID THAT WE MUST ACCELERATE THE SYSTEMS ACQUISITION PROCESS TO GUARD AGAINST OBSOLESCENSE IN THE SYSTEMS -- AND THIS INCLUDES WEAPON SYSTEMS -- FOR OUR FORCES.

THE OBJECT, AFTER ALL, IS TO ACQUIRE DEFENSE CAPABILITIES RATHER THAN TO FEED THE ACQUISITION PROCESS ITSELF.

IN THE AREA OF ACQUISITION STREAMLINING, THE UNDER SECRETARY OF DEFENSE FOR ACQUISITION AND TECHNOLOGY, DR. KAMINSKI, HAS APPROVED THE SELECTION OF THE SPACE BASED INFRARED (SBIR) SYSTEM AS A PILOT PROGRAM FOR ACQUISITION STREAMLINING. THIS IS AN AGGRESSIVE ATTEMPT TO DO IN 60 DAYS WHAT HISTORICALLY HAS TAKEN 6-9 MONTHS.

DR. KAMINSKI IS DEFINITELY A CHANGE AGENT AND IS DETERMINED TO MAKE THINGS HAPPEN.

THE GOAL IS TO STREAMLINE THE SYSTEM ACQUISITION PROCESS, WHILE MEETING ALL LEGAL REQUIREMENTS AND MAINTAINING RIGOROUS OVERSIGHT OF THE ACQUISITION.

HE HAS ALSO ASKED THE DAB COMMITTEE CHAIRMEN TO DEVELOP STREAMLINED ALTERNATIVES TO THE CURRENT COMMITTEE AND DAB OVERSIGHT PROCESS.

WHAT ARE THE OVERALL IMPLICATIONS FOR C3 OR OTHER SYSTEMS?

LOOKING AT THE LESSONS TO BE LEARNED FROM SBIR, WE MAY BE ABLE TO REDUCE THE DOCUMENTATION BURDEN LEVIED IN THE OVERSIGHT PROCESS FOR MANY ACQUISITIONS, INCLUDING C3 OR INFORMATION SYSTEMS.

ALSO, WE MAY FIND INNOVATIVE TECHNIQUES FOR OVERSIGHT THAT WILL GET US AWAY FROM THE SERIAL MILESTONE REVIEW PROCESS.

WE HAVE ADVOCATED RAPID PROTOTYPING, EVOLUTIONARY DEVELOPMENTS AND INCREMENTAL DEVELOPMENTS FOR QUITE SOME TIME, YET THE MILESTONE SEQUENCE FOR OVERSIGHT REVIEWS KEEPS US TIED RATHER CLOSELY TO THE OLD "GRAND DESIGN" OR WATERFALL MODEL FOR SYSTEM ACQUISITION.

MUCH OF THIS IS THE RESULT OF SOCIAL OPPOSITION TO CHANGE.

WE HAVE A VERY SUCCESSFUL MODEL FOR ACQUISITION OF HIGH TECHNOLOGY, HIGH COST SPACE BASED SYSTEMS ALREADY. THE NRO HAS BEEN A VERY SUCCESSFUL ACQUISITION ACTIVITY, AND THEY HAVE A TREMENDOUS TRACK RECORD.

THE STREAMLINING PROCESS THAT WE ARE TRYING TO BRING ABOUT IN THE NORMAL SYSTEM WOULD BE AUTOMATIC WITH THE NRO.

THIS WOULD STREAMLINE THIS PARTICULAR CLASS OF ACQUISITIONS, BUT NOT NECESSARILY THE OVERALL ACQUISITION PROCESS.

ON THE OTHER HAND, WE MAY WANT TO USE THE WAY THAT NRO DOES ITS ACQUISITIONS AS A COMPARATIVE MODEL FOR DETERMINING THE MOST RAPID, ALLOWABLE PATH FOR ALL ACQUISITIONS.

THIS COMING WEEKEND, DR. KAMINSKI WILL BE HOLDING AN INTENSIVE SESSION ON ACQUISITION IMPROVEMENT. I LOOK FORWARD TO SITTING DOWN AT THE TABLE TO EXCHANGE IDEAS WITH THE DEPARTMENT'S ACQUISITION SENIOR LEADERSHIP. I BELIEVE THAT THIS SYMPOSIUM IS FERTILE GROUND FOR DEVELOPING OTHER IDEAS FOR ACQUISITION IMPROVEMENT.

PINPOINTING ACQUISITION AS AN AREA THAT REQUIRES CROSS-FUNCTIONAL COOPERATION BRINGS ME TO ANOTHER SET OF STAKEHOLDERS IN THIS PROCESS -- WHICH IS THE AMERICAN INDUSTRIAL BASE.

COOPERATION WITHIN AND INDUSTRY AND THE DOD IS MORE IMPORTANT TODAY THAN EVER BEFORE AS DOD MOVES TO MORE AND MORE RELIANCE ON OUR NATION'S INDUSTRIES TO MAINTAIN

THE ADVANTAGE FOR OUR WARFIGHTERS AND TO IMPROVE THE

ECONOMIC SECURITY OF OUR COUNTRY.

WITH UNEMPLOYMENT BEING AT ITS LOWEST LEVEL FOR

YEARS, THEY MUST BE DOING A LOT THAT'S RIGHT.

WE IN THE C3I COMMUNITY HAVE ALREADY MADE STRIDES IN

MAKING STRUCTURAL AND PROCEDURAL CHANGES SO THAT WE CAN

PROVIDE BETTER SERVICE TO THE REST OF THE DEPARTMENT. I

EXPECT THE BUSINESS RE-ENGINEERING THRUST IN DOD TO GAIN

MOMENTUM AS TIME MOVES ON AND DOLLARS GET LESS.

IMPROVEMENT IN CYCLE TIME CAN ONLY BE ACHIEVED BY

REVOLUTIONARY CHANGES IN THE BUSINESS PROCESSES.

THE INFORMATION MANAGEMENT SERVICE PROVIDERS HAVE A

MAJOR TASK AHEAD OF THEM TO PROVIDE A DEFENSE INFORMATION

INFRASTRUCTURE THAT THE FUNCTIONAL AND OPERATIONAL

IMPROVEMENTS OF THE DEPARTMENT CAN RIDE UPON.

I AM ASKING GENERAL EDMONDS TO SHOULDER THE LOAD ON

THIS. DISA HAS ALREADY SHOWN ITS ABILITY TO SCRAP THE OLD AND

MOVE ON WITH THE NEW WHEN IT TOSSED OUT THE OLD WAYS OF

SELECTING STANDARD ELEMENTS.

AFTER 30 YEARS OF STANDARDIZATION EFFORTS, DOD HAD 2

APPROVED STANDARD DATA ELEMENTS AT THE BEGINNING OF THIS

YEAR. BY EARLY SEPTEMBER, WE HAD OVER 1,000 STANDARD DATA ELEMENTS. NOW WE MUST MOVE TO USING THEM.

OUR GOAL OF HAVING TOTAL INFORMATION CONNECTIVITY AMONG ALL DEFENSE UNITS, THAT IS TOTAL, SEAMLESS, EASY TO USE IF YOU NEED IT, AND IMPOSSIBLE TO USE IF YOU AREN'T ENTITLED, MUST BE REACHED. SECURITY MUST BE A CORNERSTONE OF OUR SYSTEMS AS WE DESIGN THEM.

THERE IS ONE IMPORTANT GROUP OF STAKEHOLDERS THAT I HAVEN'T MENTIONED -- AND THAT IS THE CITIZENRY OF OUR GREAT NATION. WE ARE HERE TO SERVE THEM AND TO GET THE BEST RETURN ON THE INVESTMENT OF THEIR TAX DOLLARS.

I AM PLEASED ABOUT THE PARTICIPATION OF CONGRESSIONAL STAFF MEMBERS, WHO ARE OUR REPRESENTATIVES OF THE TAXPAYERS, IN THIS SYMPOSIUM.

WE CANNOT SLOW DOWN OUR STREAMLINING EFFORTS. IF ANYTHING, WE NEED TO SPEED THEM UP.

THERE ARE STILL ANTICIPATED UPTURNS IN TOTAL DEFENSE COSTS AROUND THE TURN OF THE CENTURY. WE MUST DO WHAT WE CAN TO MAKE LASTING IMPROVEMENTS IN TERMS OF COST REDUCTIONS AND IMPROVEMENTS IN MISSION CAPABILITIES.

THE BUSINESS PROCESS RE-ENGINEERING STUDIES ALREADY PERFORMED HAVE YIELDED A LONG LIST OF IMPROVEMENTS THAT CAN BE MADE. BUT STUDIES DON'T GIVE RESULTS, ACTIONS DO.

IN LOOKING AT 130 BPR STUDIES THAT HAVE TAKEN PLACE IN DOD, NEARLY 1450 IMPROVEMENT OPPORTUNITIES HAVE BEEN IDENTIFIED.

ABOUT 30 OF THESE PROJECTS HAVE BEEN EVALUATED IN DEPTH USING FUNCTIONAL ECONOMIC ANALYSIS TECHNIQUES. BASED ON THESE ANALYSES, AN INVESTMENT OF $1.7 BILLION TO IMPLEMENT RE-ENGINEERED PROCESSES WOULD YIELD $10.5 BILLION IN POTENTIAL NET SAVINGS.

THIS IS A SIZABLE OUTLAY, BUT THE RESULTS ARE EVEN MORE SIZABLE. IN ADDITION, THERE ARE NON-FINANCIAL SAVINGS, AS IN LIVES SAVED OR DEPLOYMENT TIMES SHORTENED.

I ASSERT THAT THE DOD MUST MOVE OUT BOLDLY NOW AND IMPLEMENT THE IMPROVEMENTS THAT HAVE ALREADY BEEN IDENTIFIED.

AS MS. KENDALL AND GENERAL EDMONDS WILL BE TELLING YOU, WE ARE EMBARKING ON A NEW PHASE OF STRATEGIC ACTION IN CORPORATE INFORMATION MANAGEMENT AND ENTERPRISE INTEGRATION.

WE ALREADY HAVE A SMATTERING OF SIGNIFICANT RESULTS, AS IN REDUCING UNMATCHED DISBURSEMENTS, AND QUANTUM IMPROVEMENTS IN BATTLEFIELD MEDICAL EVACUATION. WE ARE JUST SCRATCHING THE SURFACE ON APPLYING ELECTRONIC COMMERCE AND ELECTRONIC DATA INTERCHANGE.

BUT LET'S NOT SETTLE FOR A FEW SUCCESSES. I'VE FOUND THAT IF YOU ARE USING A HAND TO PAT YOURSELF ON THE BACK, YOU CAN'T USE IT TO LEND A HAND TO SOMEONE ELSE. WE SHOULD CELEBRATE THESE SUCCESSES BY USING THEM AS EVIDENCE THAT MORE ARE FEASIBLE AND DOABLE.

WITH THESE AS THE WEIGHT ON THE LEVER OF CHANGE, ENTERPRISE INTEGRATION IS THE FULCRUM.

UNDER THE LEADERSHIP OF SECRETARY PERRY AND DEPUTY SECRETARY DEUTCH, WE MUST ACT AS A TEAM. WE MUST FORM OUR GAME PLAN AND EXECUTE IT TO THE BEST OF OUR ABILITIES.

AS GENERAL CHAPPY JAMES USED TO POINT OUT, GETTING TO THIRD BASE ADDS NO MORE TO THE SCORE THAN A STRIKE-OUT. THE STATS FOR AN INDIVIDUAL MEAN LITTLE IF THE TEAM DOES NOT WIN.

I RETURNED TO THE DEPARTMENT OF DEFENSE TO MAKE A DIFFERENCE, NOT AS AN INDIVIDUAL, AND NOT IN AN INDIVIDUAL AREA. THE OTHER MEMBERS OF THE LEADERSHIP TEAM ALSO CAME

HERE TO HELP MAKE THE IMPROVEMENTS THAT OUR NATION

EXPECTS AND THAT THE WORLD SITUATION REQUIRES.

WE MUST MOVE AHEAD IN IMPLEMENTING JOINT SOLUTIONS

THAT WILL GIVE INTEGRITY, RELIABILITY, FLEXIBILITY, SECURITY

AND STRENGTH TO DEFENSE CAPABILITIES.

WARS CANNOT BE FOUGHT AND WON WITH A SINGLE SET OF

SOLUTIONS. AND THEY CANNOT BE WON WITH THE LAST WAR'S

CAPABILITIES AND STRATEGIES.

LET'S GET ON WITH IT.

I WOULD BE GLAD TO ENTERTAIN YOUR QUESTIONS AT THIS

TIME.

Outline

- Background
- CIM/EI Goals
- Management Structure
- Functional Strategic Plans
- Key Success Factors
- Next Steps

**Corporate Information Management/
Enterprise Integration
Strategic Plan**

**Cynthia Kendall
Deputy Assistant Secretary of Defense
(Information Management)**

Background

- Deputy Secretary of Defense Direction
  - Approval of CIM Strategic Plan and EI Implementing Plan, June 13, 1994
  - Direction Given to:
    - Update and integrate the plan by Fall 1994
    - Expand planning to include functional plans
    - Identify issues to EI Executive Board and EI Corporate Management Council

**Corporate Information Management/
Enterprise Integration**

Improved Defense Capabilities

| Business Process Improvement | Data | Information Systems | Computer & Communications Infrastructure |

Enterprise Integration
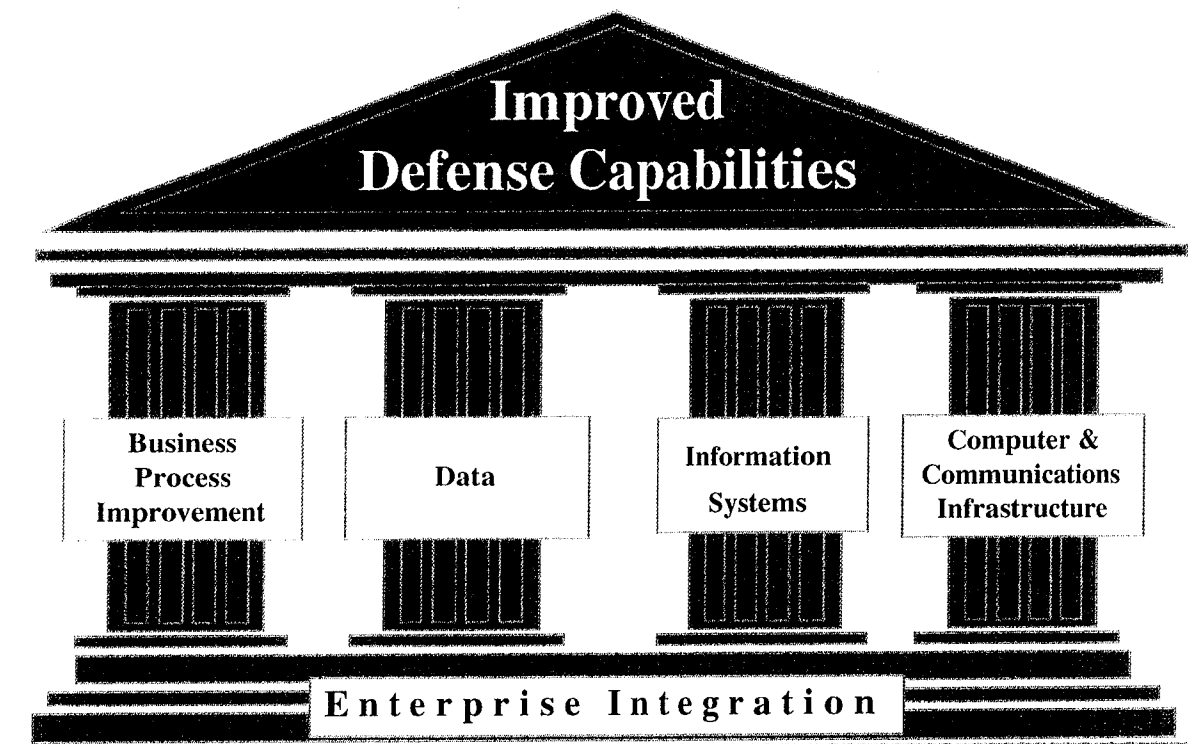
Overarching CIM/EI Goal

Enable the commanders of military forces
and the managers of support activities
to achieve the highest
effectiveness,
efficiency,
agility and
integration in their operations
through the effective use of information
applied in improved functional processes.

CIM/EI Goals

1. Re-engineer Processes
2. Shared Data
3. Minimize Duplication of Information Systems
4. Computer and Communications Infrastructure
5. Integrated Defense Enterprise
6. CIM/EI Policies and Structure

Goal 1: Re-engineer Processes

- Objectives
  - Aggressively pursue process changes
  - Implement re-engineering on a sustaining basis
- Strategy
  - Accelerate top-down re-engineering of critical processes in the next two years
  - Team approach with other initiatives

Goal 1: Re-engineer Processes

- Proposed Performance Measures
  - Process Improvements Made
    - Return on Investment
    - Performance Gains
  - Extent of usage of BPR
  - Effectiveness of BPR Tools and Support

Analysis of BPR Improvement Opportunities by Improvement Category

Number of Improvements

432 — Functional-Specific Process
302 — Mgt. & Org. Effectiveness
241 — AIS Technology
170 — Data Collect., Anal., Report.
143 — Policy
83 — Training & Education
50 — Communications Infrastructure

Improvement Opportunity Categories
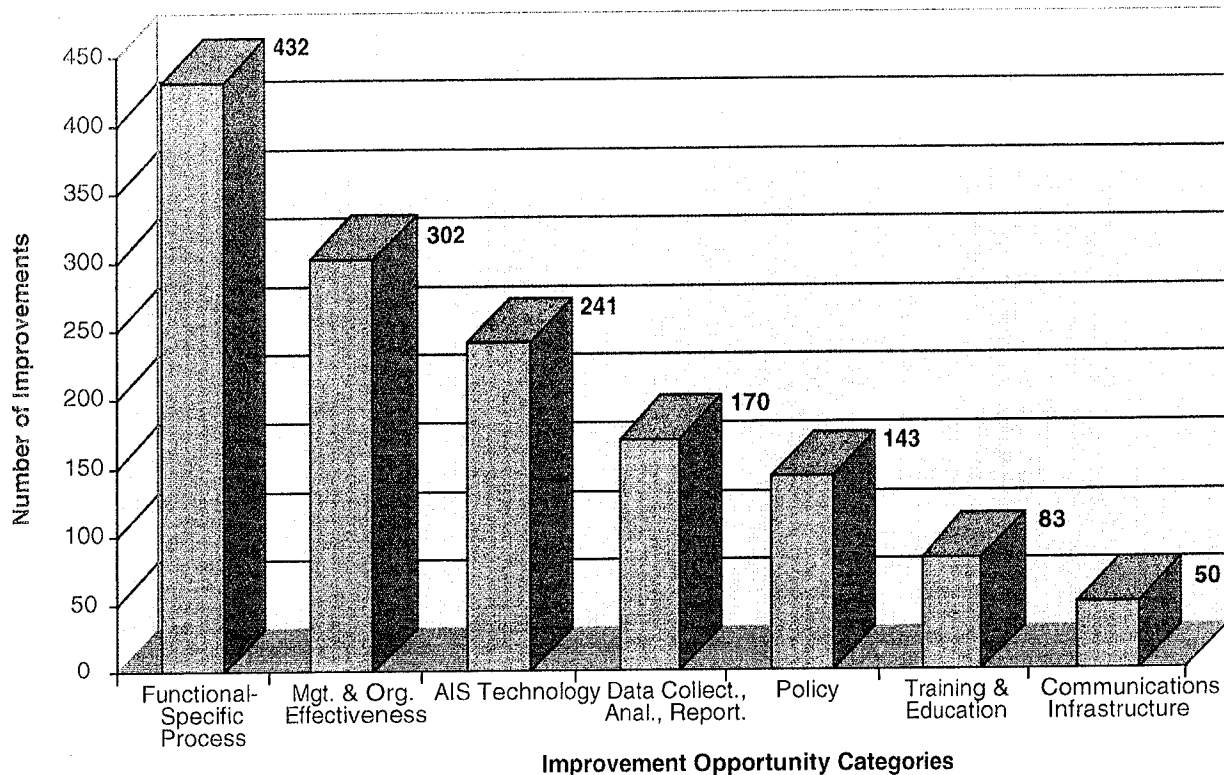
* 1,421 Improvement Opportunities Analyzed

Goal 2: Shared Data

- Objectives
  - Derive standard definitions, use in shared databases and common information systems
  - Delivery of high quality data
- Strategy
  - Link data sharing improvements to migration systems implementation
  - Evolve to integrated, shared data bases

Goal 2: Shared Data

- Proposed Performance Measures
  - Number of standard data elements
  - Shared databases meet mission needs
  - Quality data in mission terms
  - Improved DoD operations
  - Effectiveness of DoD Data Administrator

Strategy for Shared Data

Legacy Systems	Migration Systems	Target Systems
Organizational/Functional Application Databases	Functional Application Databases	Enterprise Applications and Shared Databases

Pay

Health Affairs

Personnel

Enterprise Applications

Enterprise Databases

Enterprise Applications

Data Sharing "After the Fact"	Data Sharing "By Function"	Data Sharing "Cross-Functional"
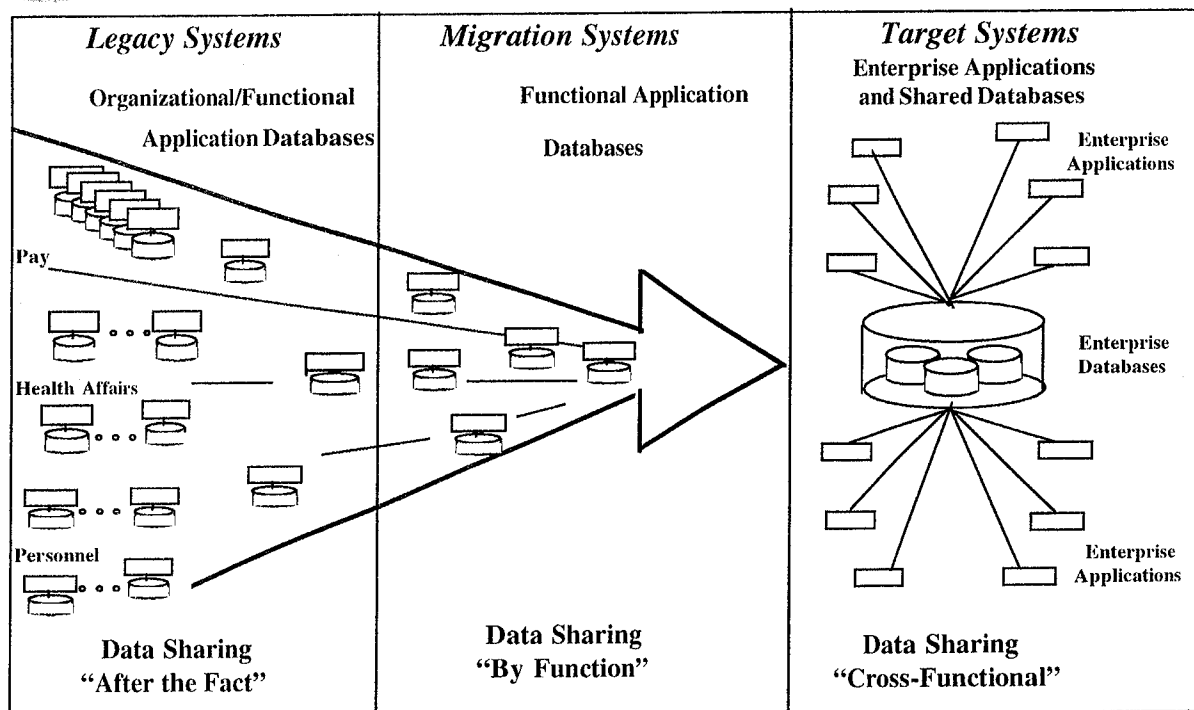
Goal 3: Minimize Duplication Of Information Systems

- Objectives
  - Migrate to common baseline of info systems
  - Incorporate re-engineering and standards
- Strategy
  - Rapidly complete migration selections
  - Implement most by FY96-97
  - Incorporate re-engineering improvements as early as possible

Goal 3: Minimize Duplication Of Information Systems

- Proposed Performance Measures
  - Number of migration systems selected and implemented
  - Legacy systems eliminated
  - Return on investment
  - Incorporation of
    - Re-engineered processes
    - Open systems standards

Goal 4: Computer and Communications Infrastructure

- Objectives
  - Info infrastructure is flexible, transparent
  - Standards based open system architecture
- Strategy
  - Evolve to meet mission information needs
  - Benchmark against best commercial practices
  - Improve software practices
  - Identify and integrate new technologies

Goal 4: Computer and Communications Infrastructure

- Proposed Performance Measures
  - Increase usage of infrastructure services
  - Competitiveness of cost and performance
  - Move to architectural standards
  - Cycle time for
    - User service requests
    - Acquire and Integrate new technologies
    - Provide added services for user needs

Goal 5: Integrated Defense Enterprise

- Objectives
  - Integrate cross-functional, technical programs
  - Integrate functional processes
- Strategy
  - EI Executive Board and
    EI Corporate Management Council
  - Functional and data linkages
  - Technical systems integration

Goal 5: Integrated Defense Enterprise

- Proposed Performance Measures
  - Cross-functional processes
  - End-to-end performance of functions
  - Integrated information systems, databases and information infrastructure
  - Reduced functional and technical costs
  - Linkage aross all missions

Corporate Information Management/ Enterprise Integration And Cross-Functional Applications

Acq Ref →
EC/EDI →
CALS →

Improved Defense Capabilities

Business Process Improvement | Data | Information Systems | Computer & Communications Infrastructure

Enterprise Integration
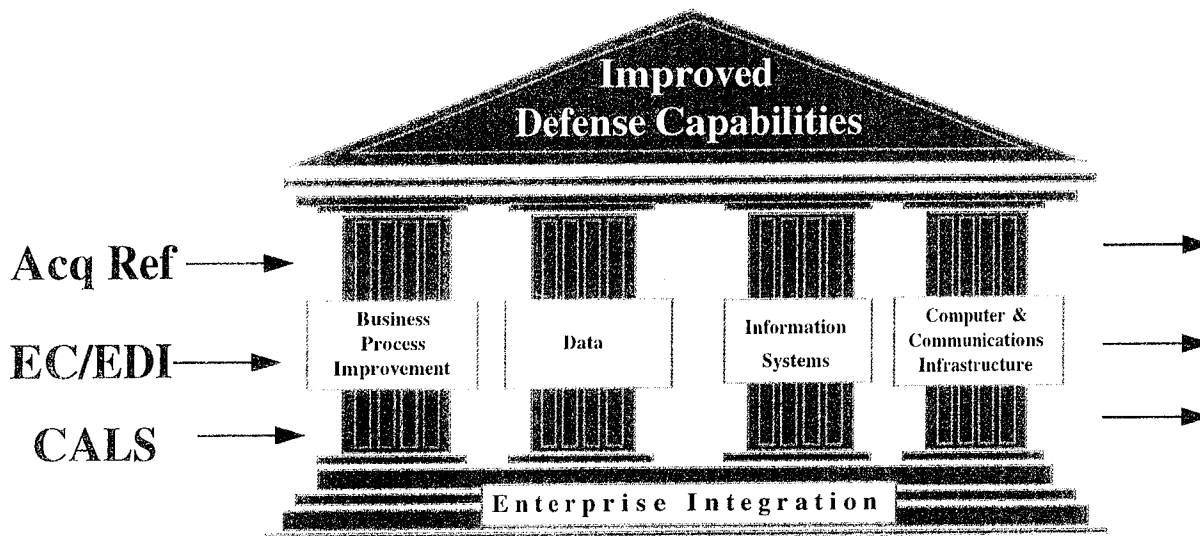
Goal 6: CIM/EI Policies And Structure

- Objectives
  - Establish management structure
  - Establish policies
- Strategy
  - Evolve policies and management structures as necessary
- Proposed Performance Measures
  - Implementation of policies is current
  - Management structures are current

Management Structure

```
                    ┌─────────────────┐
                    │  EI Executive   │
                    │     Board       │
                    └────────┬────────┘
                             │        Deputy Secretary of Defense
                             │
┌──────────────┐   ┌─────────┴────────┐
│ Support Staff ├───┤  EI Corporate    │
│ & Resources   │   │  Management      │
└──────────────┘   │  Council         │
                    └────────┬─────────┘
                             │      PDUSD(A&T), ASD(C3I)
                    ┌────────┴────────┐
                    │ Implementing    │
                    │ Activities      │
                    └─────────────────┘
```

Functional Strategic Plans
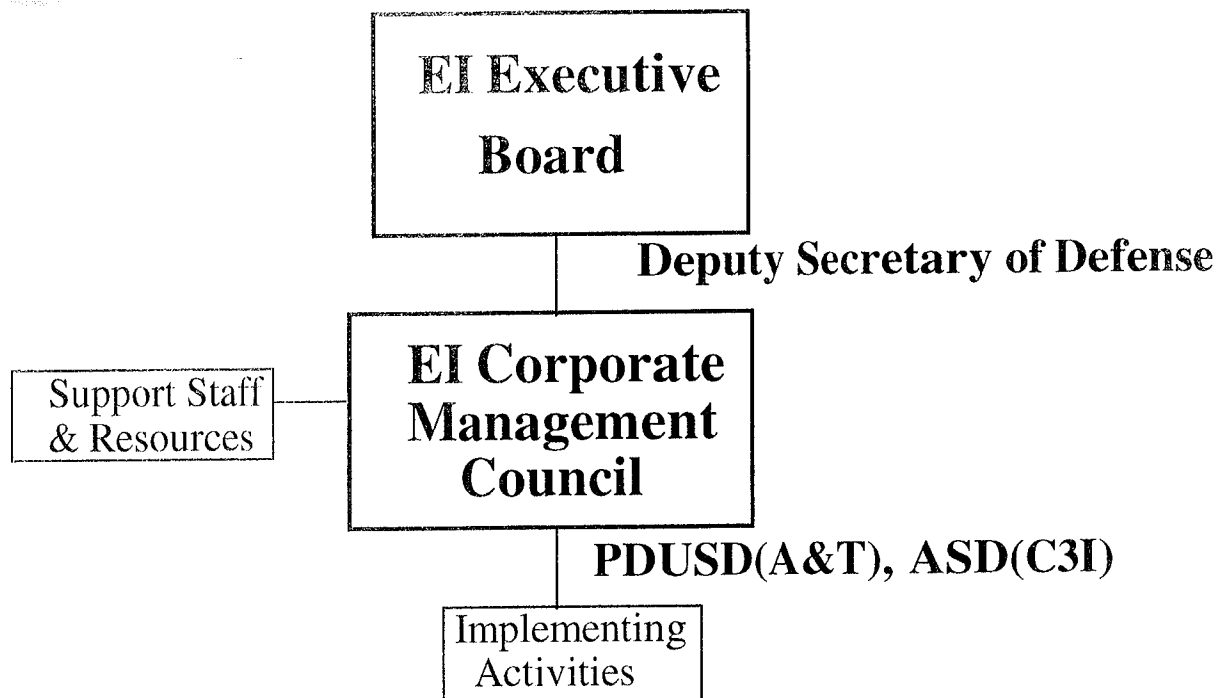
```
┌──────────────────────────────────────────┐
│     DOD PLANNING PROCESS/PPBS            │
└──────────────────────────────────────────┘
        ↕                    ↕

┌───────────┐          ┌───────────┐   ┌───────────┐
│ Health    │          │           │   │           │
│ Affairs   │  . . . . │ Finance   │   │ Others    │
│           │          │           │   │           │
└───────────┘          └───────────┘   └───────────┘
  ◄───────────────────────────────────────►
```
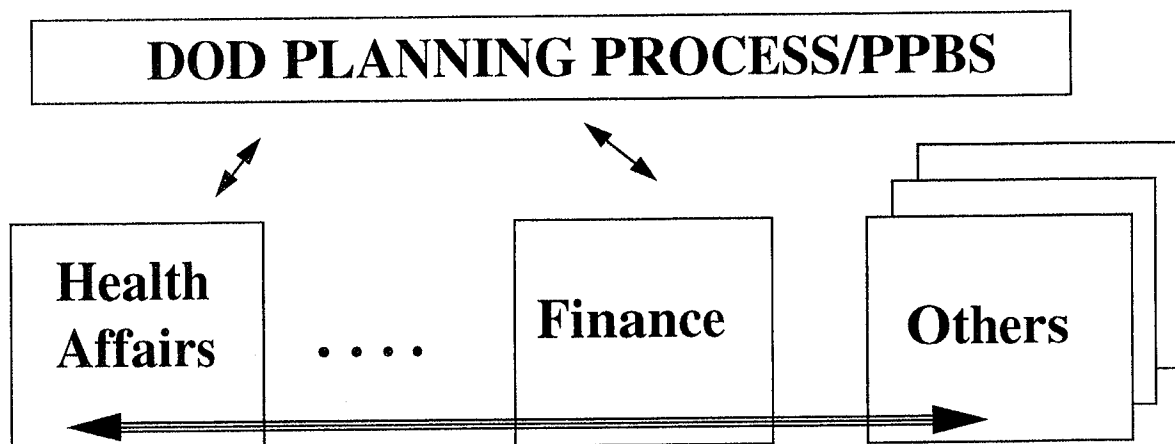
Key Factors for Success

- Expand Focus on the Warfighter
- Employ Key Management Principles
- Centralize Responsibility for EI Implementation in a Single Organization
- Combine Management Strategy for Process Re-engineering and Integrated Information
- Embed CIM/EI in Central Management Policies and Practices

Next Steps

- Approve CIM/EI Strategic Plan

- Develop Functional Strategic Plans

- Shift attention to Implementation

Comments?
Suggestions?

cynthia.kendall@osd.mil

CIM/EI Symposium

DISA Roles and Commitment

Lt Gen Albert Edmonds
Director, Defense Information Systems Agency

12/12/1994

Purpose
The purpose of this briefing is provide a top down view of DISA's progress in supporting the achievement of the Department's CIM/EI goals.

33

- "Reinvent" and reengineer DoD functional processes to achieve greater mission effectiveness at lower cost.

- Tie DoD together through the use of quality, shared data.

- Minimize duplication and enhance DoD's information systems to embody reengineered processes.

- Implement a flexible, world-wide computer and communications infrastructure.

- Implement CIM/EI to achieve an integrated Defense Enterprise.

- Establish CIM/EI policies and management structure.

12/12/1994

CIM/EI Goals

As Ms. Kendall indicated earlier, these are the six goals for the Department. Our job at DISA is to develop and execute aggressive initiatives to support the achievement of these goals.

DISA Commitment

- **DISA's commitment:**
  aggressively implement initiatives to meet the CIM/EI goals.

- **DISA's objective:**
  accelerate the process.

DISA Commitment

We are firmly committed to making the implementation phase happen. DISA's objective is to make things happen fast!

This morning, I am going to briefly talk about some of our major initiatives that help accelerate the process.

One major initiative supports the acceleration of implementing a world-wide computer and communications infrastructure.

Integrated Global Environment

The Global Infosphere

C4IFTW
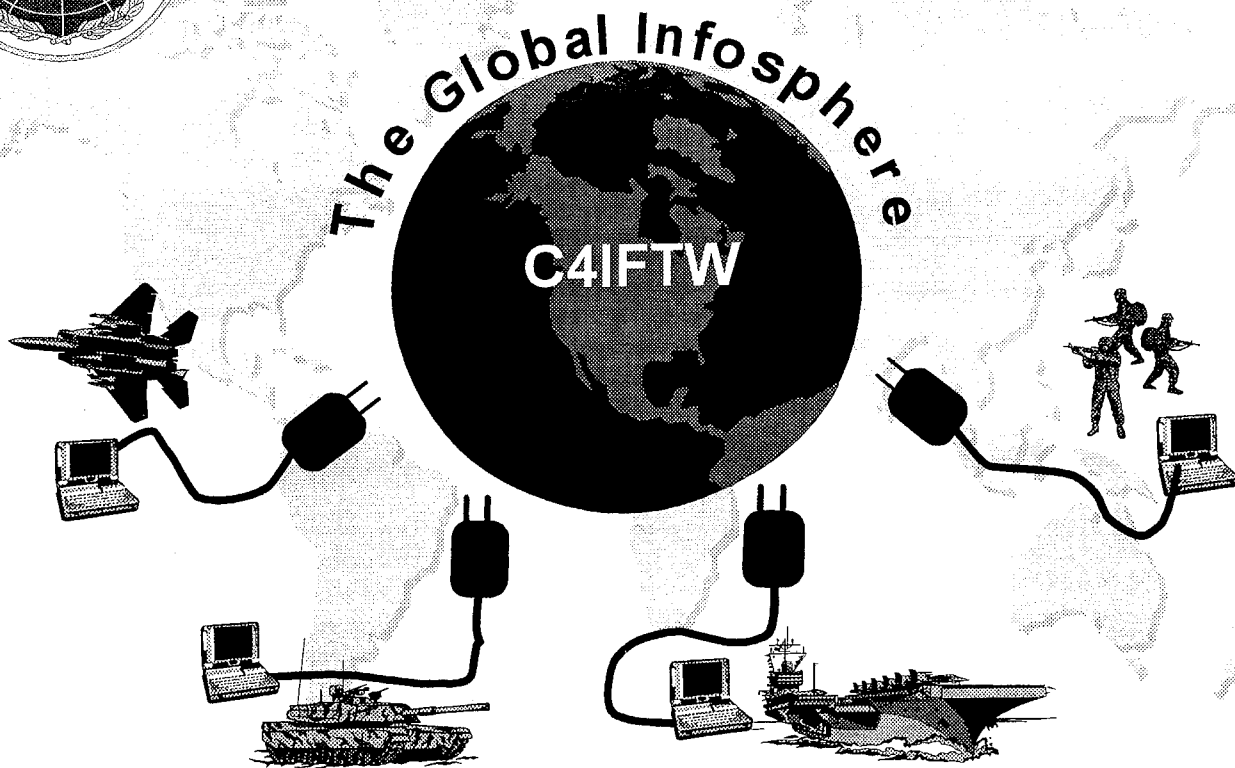
Anywhere, Anytime, Any Mission

12/12/1994

Integrated Global Environment

New national strategies envision power projection by highly flexible, rapid response, tailored force packages, under Joint Task Force (JTF) or Combined Joint Task Force (CJTF) command. These force packages will support a spectrum of military/political responses to promote national interests worldwide. The National Military Strategy dictates that the US Forces must be structured to project power from CONUS bases, sanctuary locations and the in-theater locations to an area of conflict anywhere in the world.

The combination of reduced funding and the new international political environment means the number of US Forces forward deployed outside the CONUS, as well as overall force size is steadily shrinking. The ability to project force is constrained by limited strategic lift necessitating a greater "tooth-to-tail" ratio in the structure of deployed forces. As a result, the military Services will become increasingly reliant on long-distance communications and logistics capabilities to fulfill their global mission.

The new warfighting context outlined in the National Military Strategy drove the development of a concept to guide all the Services toward a global C4I system. The common global vision of C4IFTW is to create a single view of joint military C4I. The three functional components of information critical to the warrior are Command and Control (C2), Intelligence, and Mission Support. This information to the warrior — whether on air, land, sea, or space — must be integrated in a secure seamless manner among the Services and Defense Agencies. This view is of a widely distributed user-driven infrastructure to which the warrior "plugs in".

36
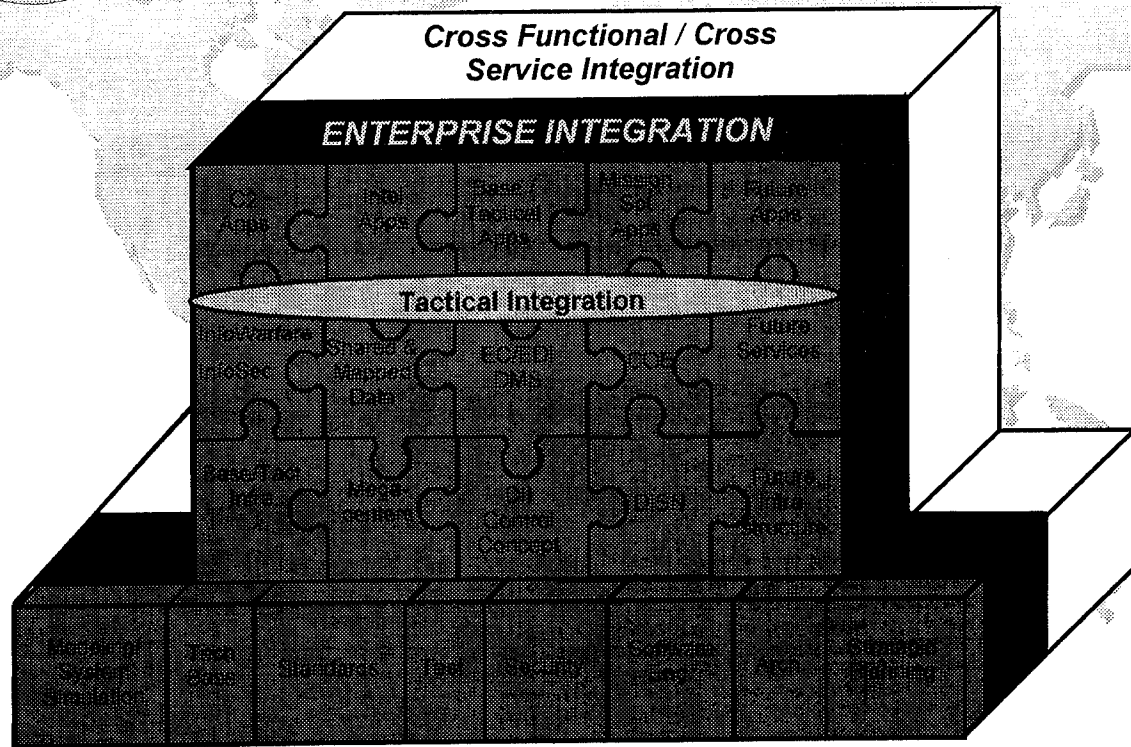
Elements of the DII

The Defense Information Infrastructure (DII) provides information services for the Services and Defense Agencies. The DII is made up of numerous elements as shown by the puzzle pieces and blocks in the graphic. As the DII evolves, the number and types of elements may change. These elements are built on and include a foundation of integration and technology support elements. The base includes transport and processing standards; appropriate levels of information security; sound architecture; modern software engineering practices; thorough testing; modeling and simulation capabilities to assess need for changed services; and continual assessment of new technology as it could be applied to the DII.

The elements of the DII includes applications in all DoD mission areas, C2 (e.g., Global Command and Control System (GCCS)), including tactical applications ; Intelligence (e.g., the DoD Intelligence Information System or DoDIIS); and Mission Support (e.g., the Depot Maintenance Standard System).

In addition to information transport services like DISN, base level infrastructures (e.g., SBIS) and deployed communications services, the DII also includes value added services of electronic commerce, electronic data interchange (EC/EDI), and messaging (in the form of the Defense Message System (DMS)) are included in the DII. Information warfare (and associated information security to protect DII information assets) is also dependent on the DII for its success.

Much of the core of the DII is to be found in the Common Operating Environment (COE) and its support of cross-functional, cross-Service integration; the Defense Information System Network (DISN) communications base; the 16 Megacenters for handling major information system processing and maintenance; and the DII Control Concept to manage the DII network and systems. The COE will be evolutionary in its development and will start with the COE already established for GCCS. In particular, the COE incorporates the common processing services needed by information processing in the DII.

The key to effective use of the DII by Services and Agencies is the effective cross-functional and cross-Service integration and sharing of information, from the Enterprise level on down. A key to this integration and sharing is shared data that can support interoperability of applications between Services and functional areas as needed to conduct the Department's missions.

Proposed DII Definition

The DII is a seamless web of communications networks, computers, software, databases, applications, and other capabilities that meets the information processing and transport needs of DoD users in peace and in all crises, conflict, humanitarian support, and wartime roles. It includes:

- The physical facilities used to transmit, store, process and display voice, data, and images.

- The applications, engineering, and data practices (tools, methods, and processes) to build and maintain the software that allow C2, Intelligence, and Mission Support users to access and manipulate, organize, and digest proliferating quantities of information.

- The network standards and protocols that facilitate interconnection and interoperation among networks and systems and provide security of the information carried.

- The people and assets which provide the integrating design, management and operation of the DII, develop the applications and services, construct the facilities, and train others in DII capabilities and use.

Proposed DII Definition

The definition of the DII has been aligned with the definition of the NII. It (the definition) has been built to stress the support for the warfighter but to recognize the broad mission of the DoD and the need to commit to the NII and the Global Information Infrastructure (GII). The elements in the definition cover all the pieces that make up the DII; physical assets, applications, software, networks and the people and financial resources.

DII Roles & Responsibilities
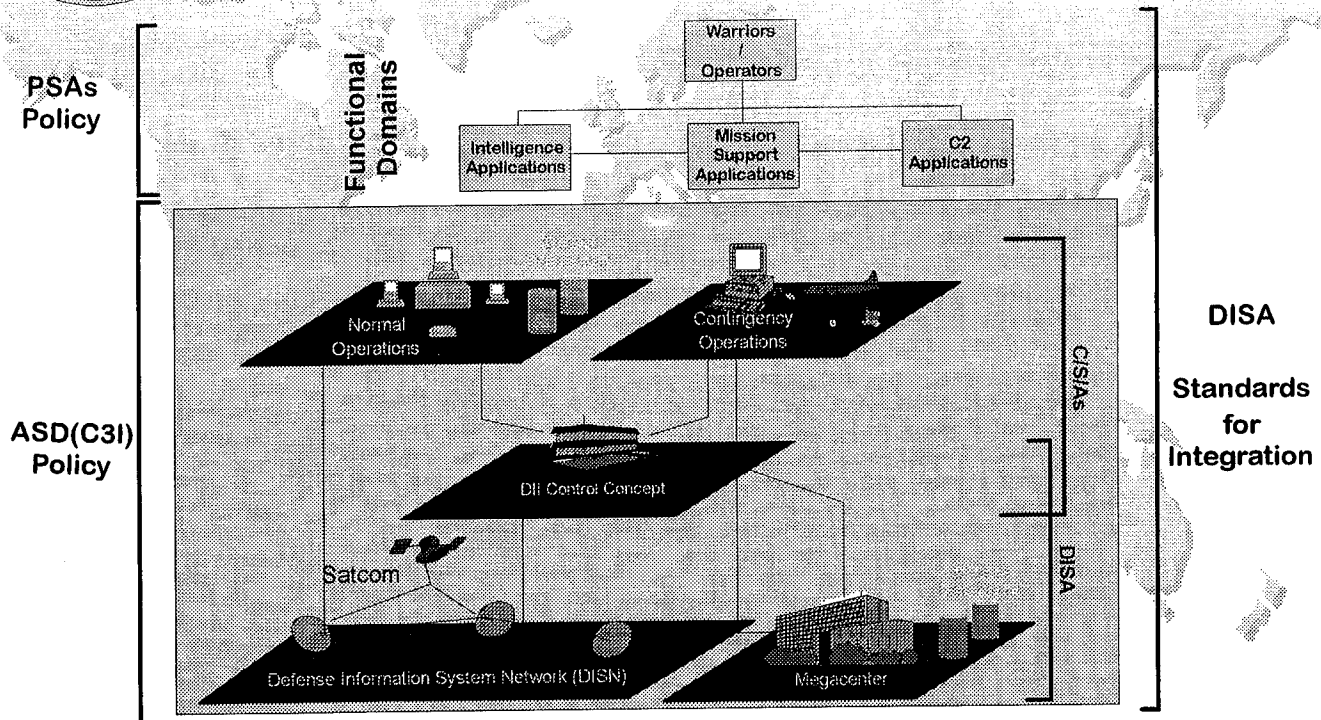
DII Roles & Responsibilities

This graphic shows the elements of the DII, along with organizational responsibilities. These responsibilities, taken together, ensure that every aspect of the DII will be addressed. The responsibilities are as follows:

- The Principal Staff Assistants(PSAs), including the Joint Staff, plan and fund the mission applications, including data requirements, for C2, Intelligence, and Mission Support.

- The Commanders in Chief(CINCs), Services, and Agencies (C/S/As) install and operate the sustaining base and deployed infrastructure that support normal and contingency operations.

- DISA installs and operates the enterprise infrastructure(e.g., DISN and the Megacenters).

- DISA and the C/S/As share in the installation and operation of the DII control centers, which manage the DII.

- The PSAs set the policy for the mission applications and data.

- The Assistant Secretary for Command, Control, Communications and Intelligence(ASD(C3I)), sets the policy for the infrastructure, including the sustaining base, deployed, and enterprise components.

- DISA manages the integration of the DII Elements through collaboration with the PSAs and C/S/As.

39

DII Interdependencies

This slide illustrates a notional view of the interdependencies among the DII elements. Understanding these interdependencies is necessary for prioritizing DII activities. The successful deployment of the functional elements depend on the support of both the enterprise infrastructure and the base/tactical infrastructure. On the enterprise infrastructure for example, DISA is challenged to provide and field comprehensive and affordable security solutions to our customers for the security needs of their migration applications.

40
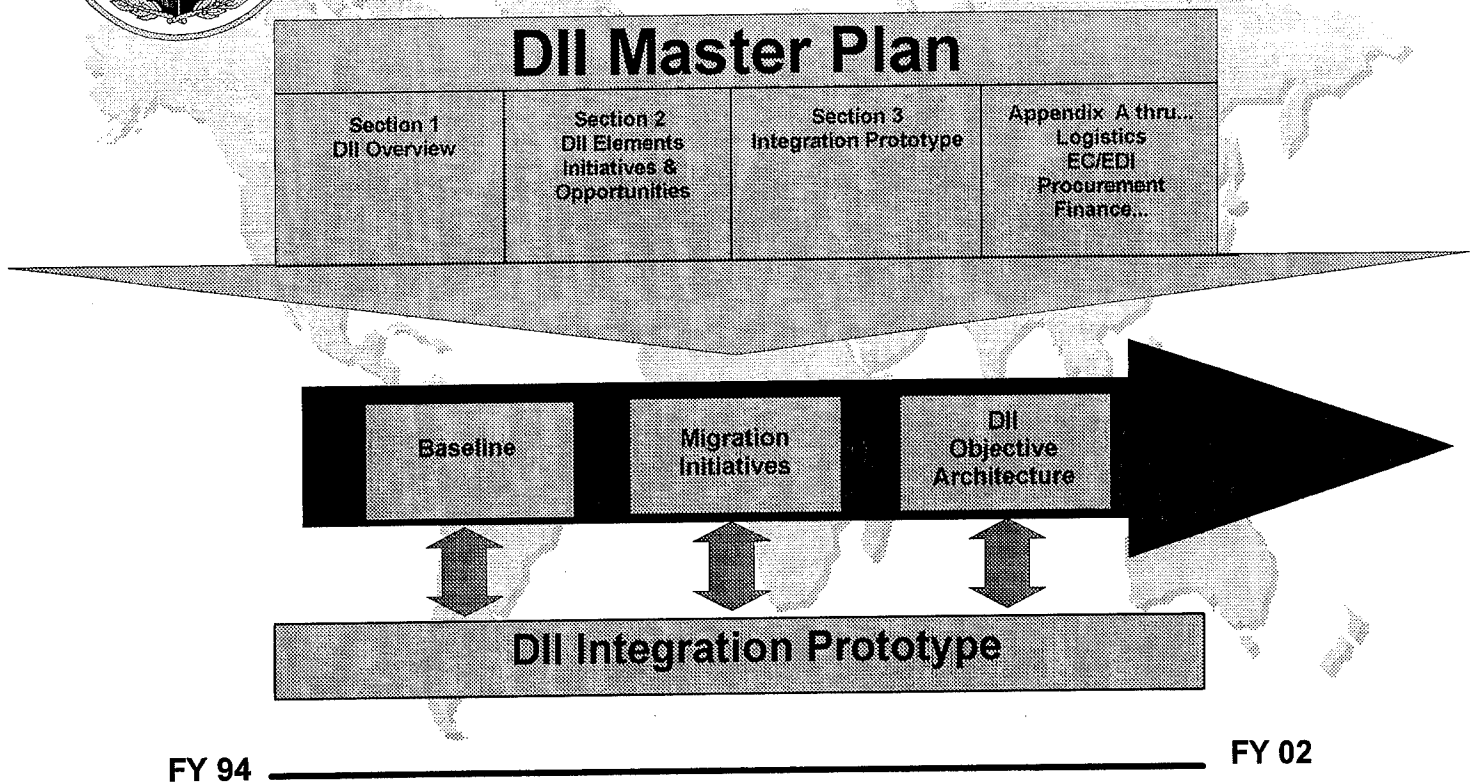
Master Plan

This slide highlights how the Master Plan is used as a management tool to manage the evolution of the DII. The Master Plan 1) establishes the common vision of the DII for all of DoD to ensure unity of effort, 2) enables integrated planning of DII efforts across DoD to ensure that the right resources are programmed to do the right things, at the right time, by the right organizations, and 3) provides the overall strategy for evolving DoD information systems into the DII. It endorses the concept of DII Integration Prototype as a vehicle to integrate the DII elements in an operational environment to "build a little - test a little" in order to see "how the elements integrate".

A&T/DISA Team

- **Established a management structure**
- **Conducted Wall to Walls**
- **Established Teams**
  - **EC/EDI**
  - **Logistics**
  - **Procurement**
  - **Environmental Security**
  - **Resource Management (EI)**
- **Established programmatic baseline**
- **Working cross-functional initiatives**

A&T/DISA Team

DISA is playing an active role in enterprise level integration. The Undersecretary for Acquisition and Technology has invited DISA to assist them in the A&T enterprise integration within their own functional domain.

DISA has developed a teaming approach to accomplish this.

Integration Prototype
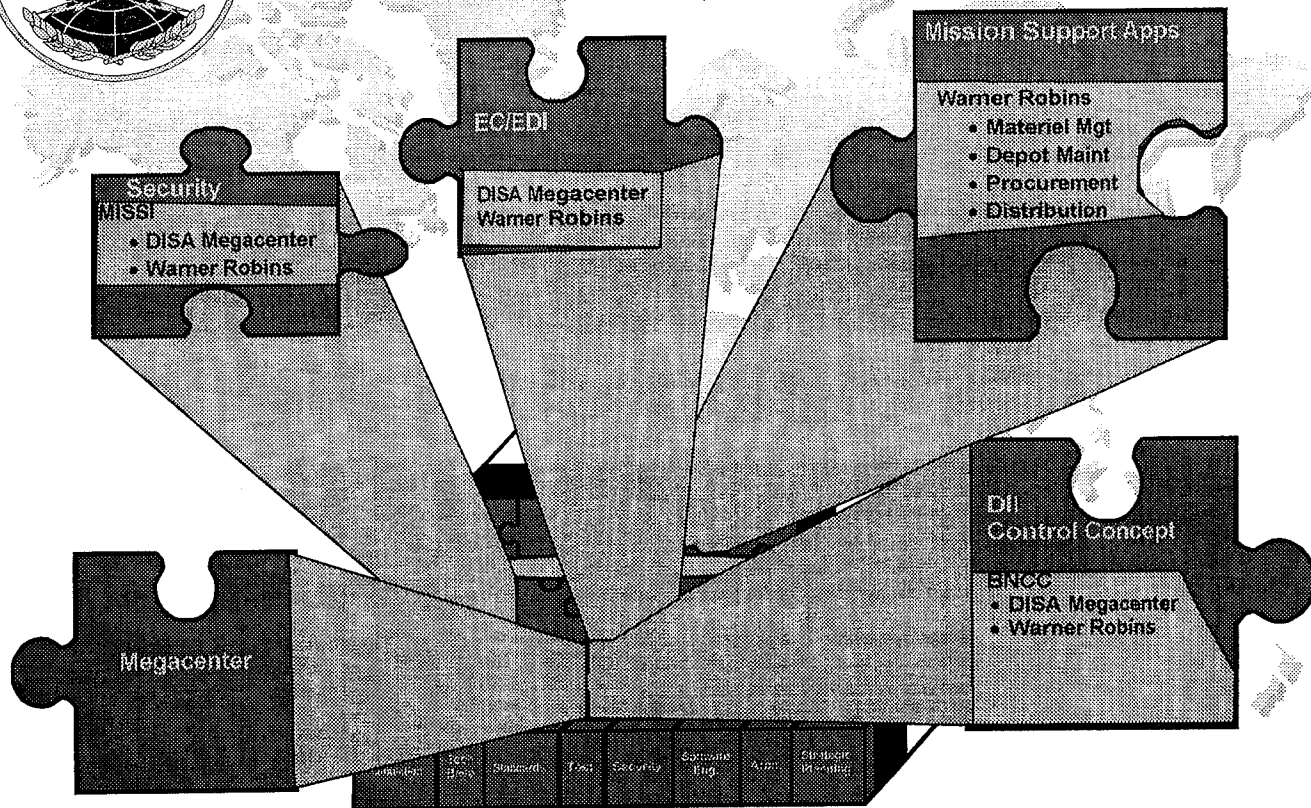
12/12/1994

Integration Prototype

This slide highlights how elements of the DII will be taken to DII Integration Prototype sites for integration testing and assessment. For example, security solutions can be integrated with logistics applications and the megacenter at a prototype site such as Warner Robins. It is important to show integration of the DII elements in an operational environment.

Notional Warner Robins Activities

This slide provides a high level view of the activities necessary to support migration application implementation at the Warner Robins Logistics Demonstration site. The shaded blocks indicate DISA activities and the non-shaded blocks show work to be performed by Service or Agency personnel.

44
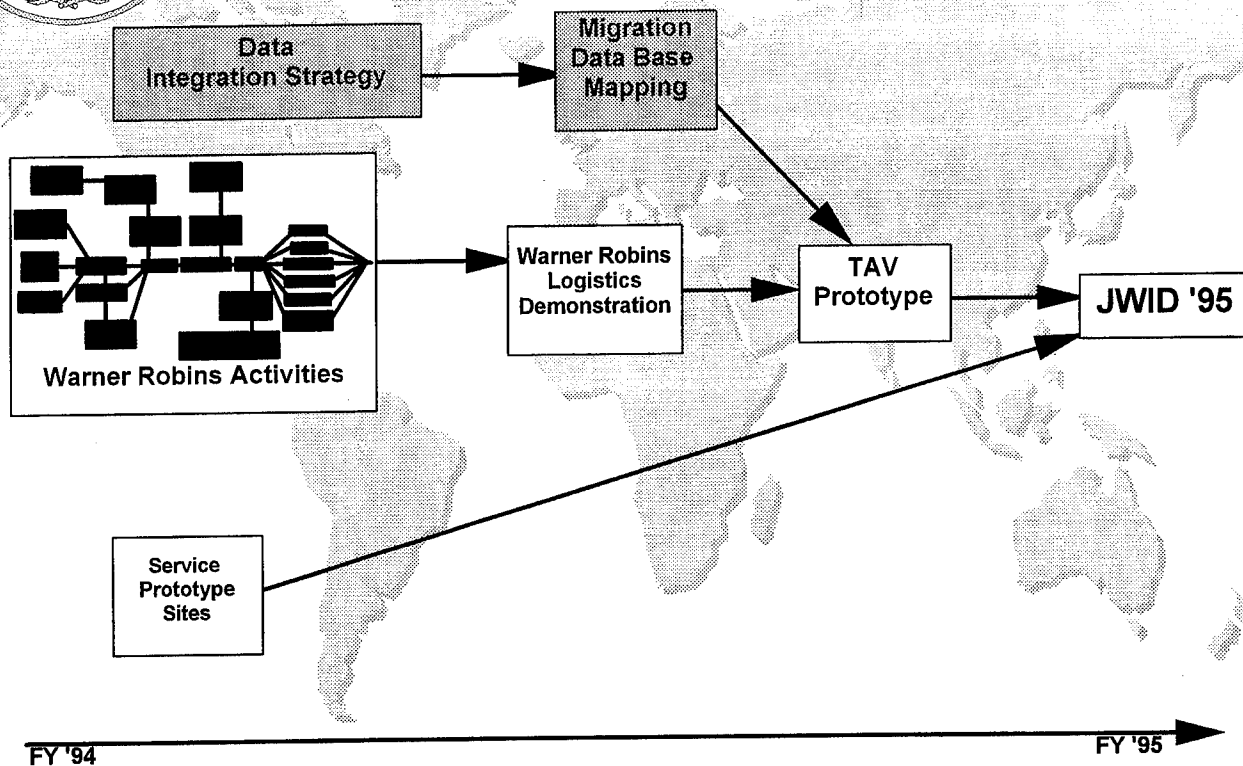
Activities Leading to JWID '95

Activities Leading to JWID '95

This slide provides a high level view of the activities necessary to support demonstration of the Total Asset Visibility concept as part of the JWID '95. The two shaded blocks indicate activities to be supported by DISA.

45

Data Administration
- Policies and Procedures
- Models
- Standardization / DDRS

Software Development

Information Engineering
- Functional Process Improvement
- Functional Economic Analysis
- Tools

Infrastructure Program
- Infrastructure Operations Improvement
- DoD COTS Product Management
- Automation Resources Management
- IT Asset Management

Software Infrastructure
- Reengineering
- Software Process Improvement
- I-CASE and Technology Transfer
- DISA Software Reuse Program
- Metrics

Defense Automation Resources Information Center (DARIC)

Education Institution Partnership Program

Ada Dual-Use Initiative

DoD Software Reuse Initiative

12/12/1994

Center for Software

DISA has consolidated all software development functions within DISA and combined them with those of the Center for Information Management and created the Center for Software.

The Center for Software is a critical link in our efforts to achieve the CIM/EI goals. Shareable, useable data is the lifeblood for success.

Data Standardization Status

JULY 1, 1994

Approved Standard Data Elements (Attributes):	529
Approved Prime Words (Data Entities):	279
Approved Generic Elements	19
Total	627

PIPELINE

Candidate Standard Data Elements (Attributes):	410
Candidate Prime Words (Entities):	77
Total	487

AS OF NOVEMBER 29, 1994

Approved Standard Data Elements (Attributes):	1,150
Approved Prime Words (Data Entities):	362
Approved Generic Elements	19
TOTAL	1,531

PIPELINE

Candidate Standard Data Elements (Attributes):	716
Candidate Prime Words (Entities):	287
TOTAL	1003

Data Standardization

This slide provides a look at our progress since 1 July 1994 and a look at whats in the pipeline.

Summary

- DISA is working to accelerate the institutionalization of business process engineering across the DoD. (Team Approach)

- DISA is working to accelerate the data standardization process. (Center for Software)

- DISA is working with the functionals to accelerate the elimination of unnecessary, duplicate systems. (Migration)

- DISA is working to accelerate the implementation of a world-wide computer and communications infrastructure. (DII)

- DISA is working to accelerate the integration of cross-functional processes. (DII Prototype, JWID)

- DISA is working to accelerate the establishment of CIM/EI policy. (Team Approach, DII Master Plan)

12/12/1994

Summary

DISA was given the task of providing technical support to Corporate Information Management. We have been very active in doing that. We have helped our DoD customers do business process reengineering, data administration, migration, architectures, and standards.

We've had numerous successes. We're excited about the DII Master plan and its implementation as a DoD strategy. We're excited about the DII Prototype and our efforts at Warner Robins. We're excited about our progress in the migration and data standardization processes.

In summary, DISA is moving forward aggressively to support the achievement of all the Department's goals.
We are making things happen. I know you will enjoy watching and being a part of the success.

Thank you for this opportunity.

Enterprise Integration in Action

Prototyping

Dependency on Logistics Systems Modernization

C3I Systems

Logistics/Transportation Sys

Applications

Data

Non-Financial Procedures

Logistics Data Base

Financial Procedures (Rcpt/Issues, Order, Release Suspend, etc.)

Production Management & Scheduling

GTN/ITV Data Bases

Procurement Systems

Pre-award Procedures

Post-award Procedures

Financial Systems

Financial System (s)

Disbursments Collections

Budget Exhibits

General Ledger

1307

Other

50

Business Process Improvements Scenarios

CORE FUNCTIONS	SUPPORTED ACTIVITIES	LOGISTICS PROCESSES	MIGRATION SYSTEMS	ENTERPRISE INTEGRATION

Combat Readiness and Availability

Establish Direction — Determine Requirements — Readiness Prioritization Buy/Repair Rqmts Force Structure Planning Costs and Pricing — SMMC — C2 Apps

Develop Plans — Operating Program Extrapolation Requirement Simulations — EIS RCS DMMIS — Intel Apps

Base/Tactical C2 Apps

CMIS JCALS EIS JEDMICS ADCS — Mission Support Apps

Acquire Assets — Produce Assets — Configuration/Engineering Data Depot Repair/Manufacture — DMMIS TIMA EIS DM-HMMS LIMS — Info Warfare/ Info Sec

Provide Capabilities — Manage Assets — Levels Computations/Redistrib. Requisition Processing — RCS SCS EIS IMACS — Shared and Mapped Data

Support Assets — Asset Visibility Production Management — DMMIS — EC/EDI DMS

COE

Employ Forces — Develop Capabilities — Project & Resource Planning — BAIM PDMSS FEM TIMA LIMS DM-HMMS EIS — Base/Tactical Infrastructure

Megacenters

Sustain Operations — Direct Repair of Materiel Procure Replacement Materiel Manage Supply & Technical Data — MP&E PDSS PCTSS EIS — DII CC

DISN

System Requirement — CMIS — JEDMICS — JCALS — ADCS

F15 SPO North — F15 SPO South — McDonnell-Douglas

Dec 94

DII Infrastructure

PDSS

Procurement (SPS)

Jul 95

DII Infrastructure

DFAS — EDI — EDI — Vendor

Oct 96

DII Infrastructure

1 December 1994

SUMMARY

Where Does It All Lead?

DoD Enterprise Planning

VI — National Defense Doctrine and Policy

VII — Joint Warfighting Plans and Operations

V — PPBS and Support Services

I — Mission Support

| Fiscal Resources | Human Resources | Materiel Resources | Information Management Resources | Command and Control III | Intelligence IV |

Defense Information Infrastructure

II

---

1 December 1994

The DoD Enterprise Model

Establish Policy
- Establish Policy
- Determine Requirements
- Develop Plans
- Allocate Resources

Manage Acquisition
- Manage Acquisition
- Engineer
- Produce Assets

Manage Assets
- Manage Assets
- Support
- Develop Capabilities

Constitute Forces
- Constitute Forces
- Provide Operational Intelligence
- Conduct Operations

Establish Policy
- Assess World Situation
- Establish National Security Priorities
- Establish Defense Priorities/Strategies

Manage Acquisition
- Define and Justify Program
- Develop Acquisition Guidance
- Administer Acquisition

Manage Assets
- Analyze Asset Rqmnts & Availability
- Decide Disposition
- Assign Assets

Constitute Forces
- Organize Command
- Assess Plans & Orders
- Integrate Forces

Determine Requirements
- Evaluate Capabilities & Performance
- Develop Doctrine
- Structure Organization & Forces
- Produce Requirements

Engineer
- Demonstrate/Test
- Conduct Research
- Design

Support
- Maintain
- Enhance
- Position
- Separate

Provide Operational Intel
- Provide Products to Commanders
- Fuse/Analyze
- Collect Operational Intelligence Data

Develop Plans
- Develop Courses of Action
- Identify Objectives/Missions
- Develop Detailed Plans
- Direct Execution

Produce Assets
- Build
- Access
- Buy/Lease

Develop Capabilities
- Integrate
- Train
- Assess Readiness

Conduct Operations
- Conduct Conventional Ops
- Conduct Strategic Nuclear Ops
- Conduct Tactical Nuclear Ops
- Conduct Space Ops
- Conduct Special Ops
- Conduct Intra/Inter Gov't Ops

Integration Management

Allocate Resources
- Develop Programs/Budgets
- Consolidate Capabilities and Timing
- Balance Programs/Budgets

Configuration Management

1 December 1994

52

Enterprise Integration Management

FUNCTIONS

CINC
...
Command
...
Agency
...
Service
...

Establish Direction
Acquire Assets
Provide Capabilities
Use Forces

An Enterprise Integration Management concept supports:

- Functional tailoring to support DoD missions
- Cross-functional management
- A cohesive and compliant view of the Defense Information Infrastructure

Establishing the concept now, allows:

- Comprehensive approach to infrastructure evolution
- Framework for reengineering/ improving the basic information processes for maximum savings

Provides business case for recommended Proofs of Concept/ Prototypes

(Data Integration)
Shared Data Initiatives

Legacy Systems	Migration Systems	Target Systems
Organizational/Functional Application Databases	Functional Application Databases	Corporate Applications and Shared Databases

Finance

Personnel

Acquisition
Distribution
Maintenance

DoD Corporate Applications

DoD Corporate Databases

DoD Corporate Applications

Data Sharing
"After the Fact"

Data Sharing
"By Function"

Data Sharing
"Cross-functional"

DII Roles & Responsibilities
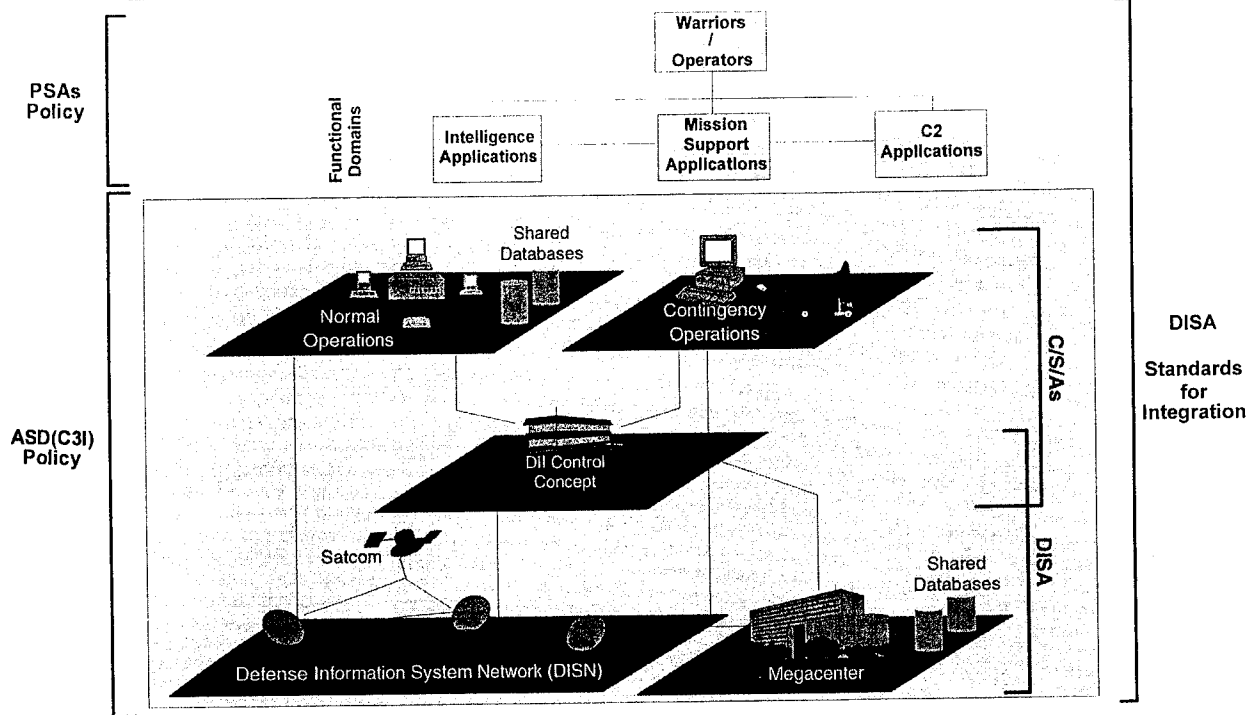
Functional/Technical Infrastructure Relationship
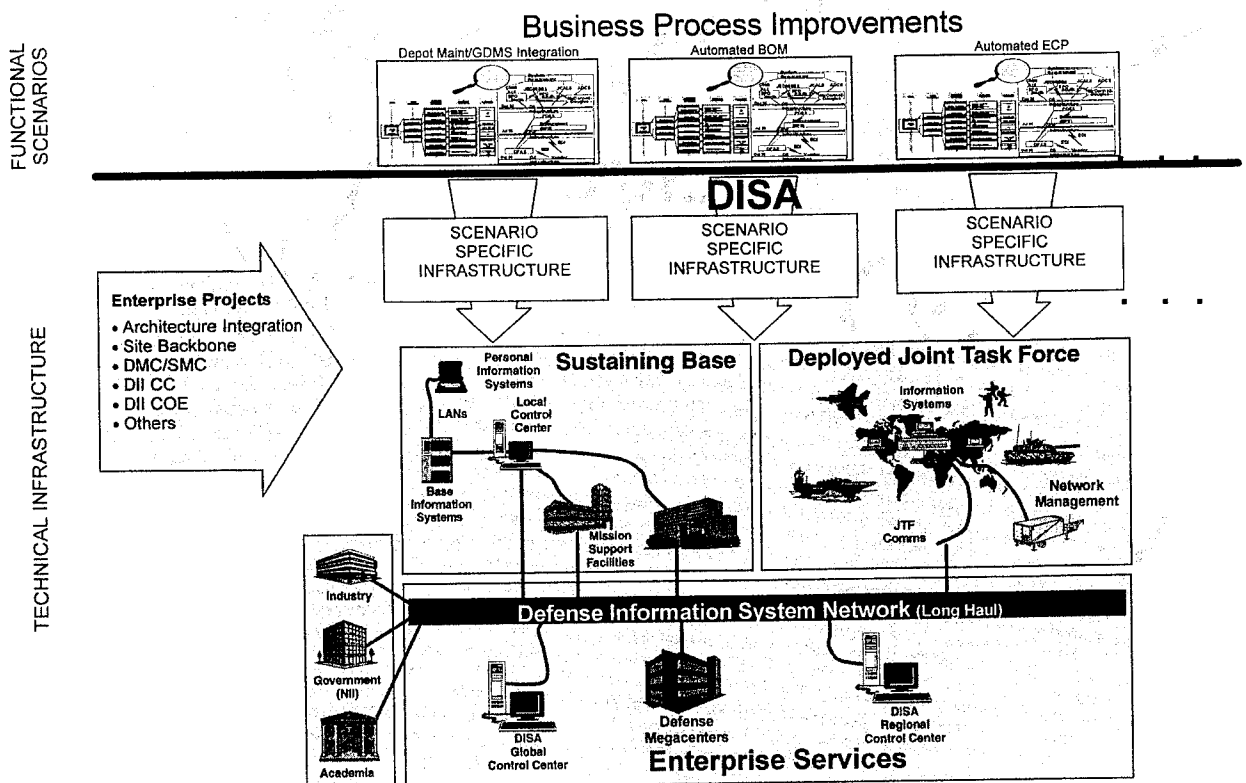
Start

Corporate

Military

Call for	**Guidance** → **May Call for New** → **Agreements**
	Abides by Existing
Governs/Directs	**Calls for**
Provide Level and Timing of Response to	**Capabilities** → **Require** → **Plans**
	Establish/Resource
Have Assets at	**Organizations** ←
Located at	**Direct** → **Actions**
Acquire/Manage/Use	
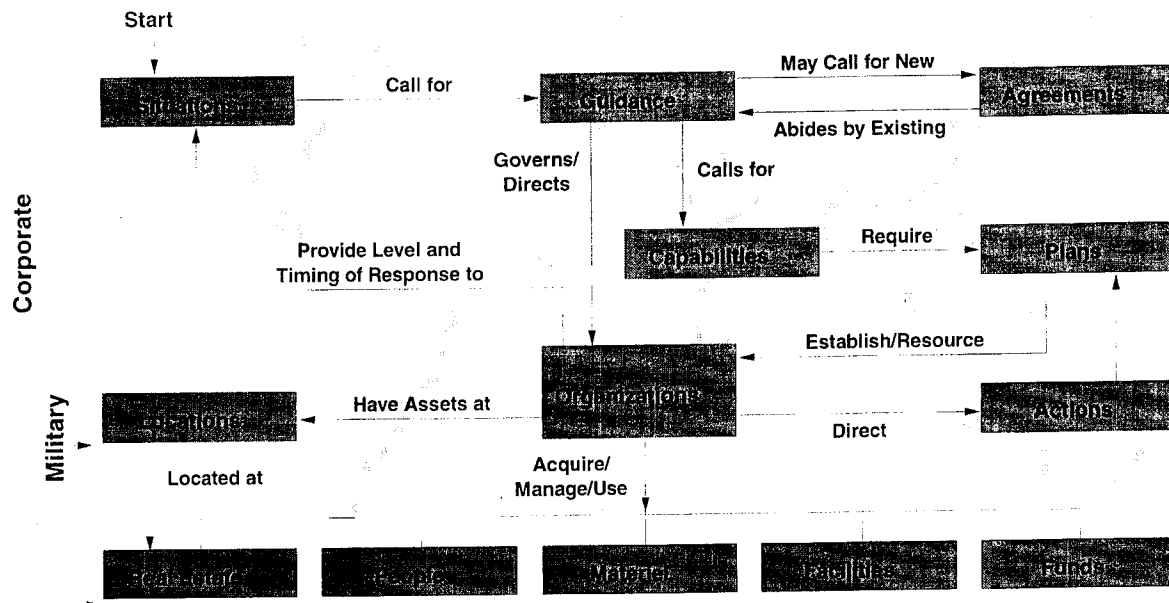
1 December 1994

Enterprise Integration: Steps in Implementing Our Goals

Defining Enterprise Integration (EI)

What is EI?

EI means making the transformation of the Enterprise happen by <u>changing</u> from "stovepipe" thinking to **"enterprise"** thinking and operations.

56

Changing to "**Enterprise**" thinking and activities MEANS:

- Creating an organizational framework that integrates (coordinates) the dimensions of successful changes

- Those dimensions flow from an Enterprise <u>strategy</u> through <u>people</u> and <u>culture</u> to <u>process</u> and <u>technology</u>

Organizational Framework for Integration
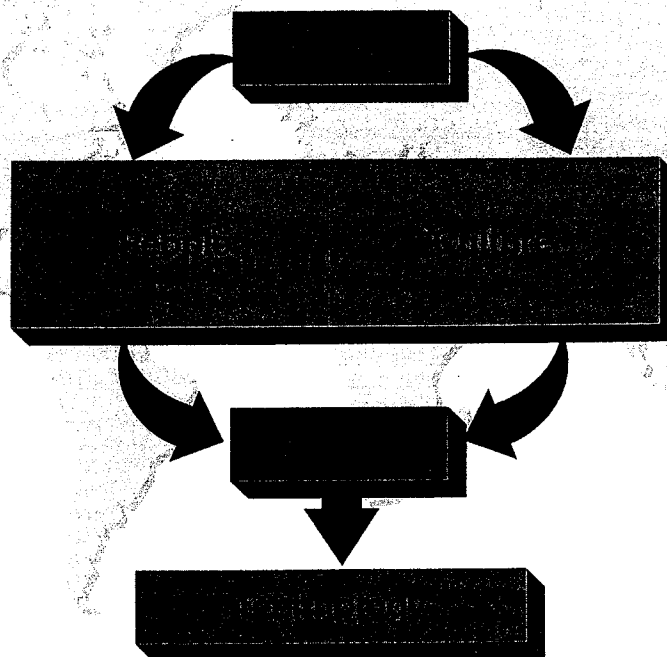
1 December 1994

How Enterprise Integration Applies to the Department of Defense

DoD at Crossroads

1 December 1994

Effectiveness

Greater
Efficiencies &
Economies

Superior,
Ready
Defense
Capabilities

Cost

- Rapidly Become Far
  More Efficient and
  Cost-Effective

- Streamline Forces
- Modernize and Integrate
- Enhance Readiness and
  Sustainability
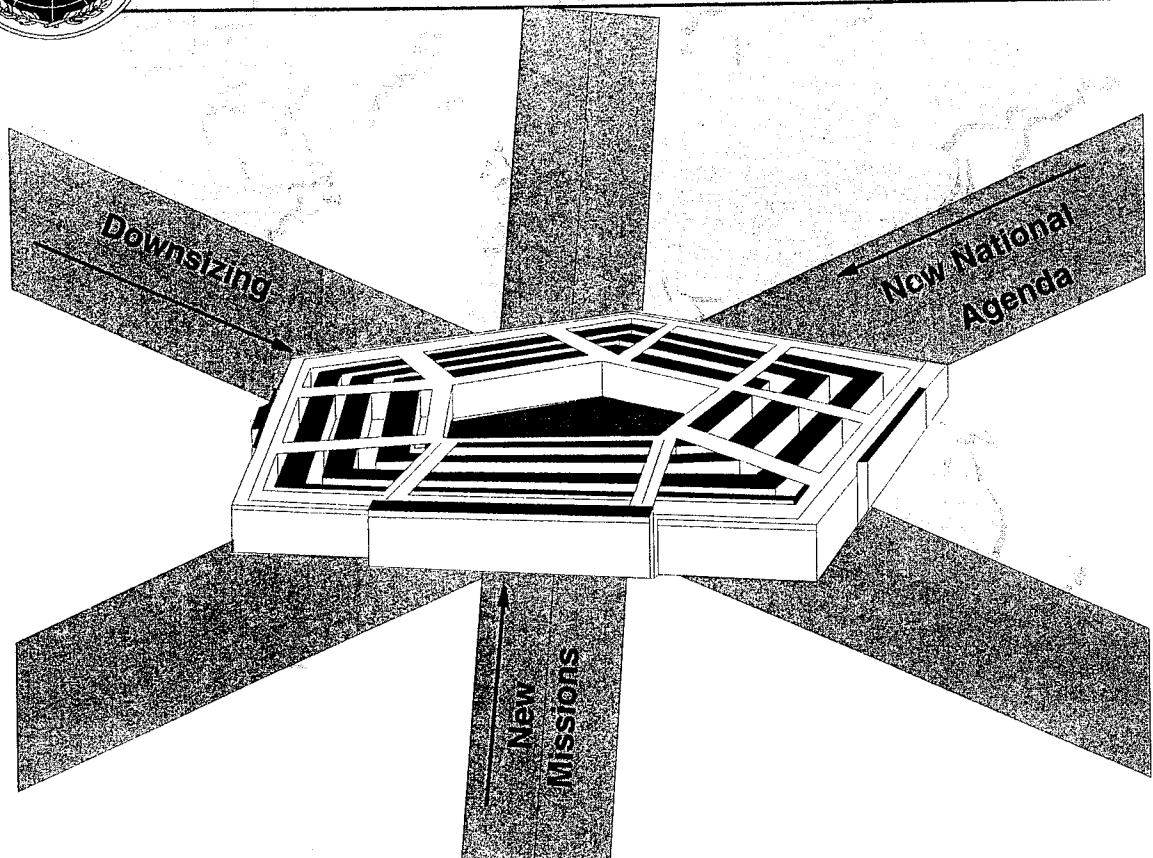
Current Capabilities
and Forces
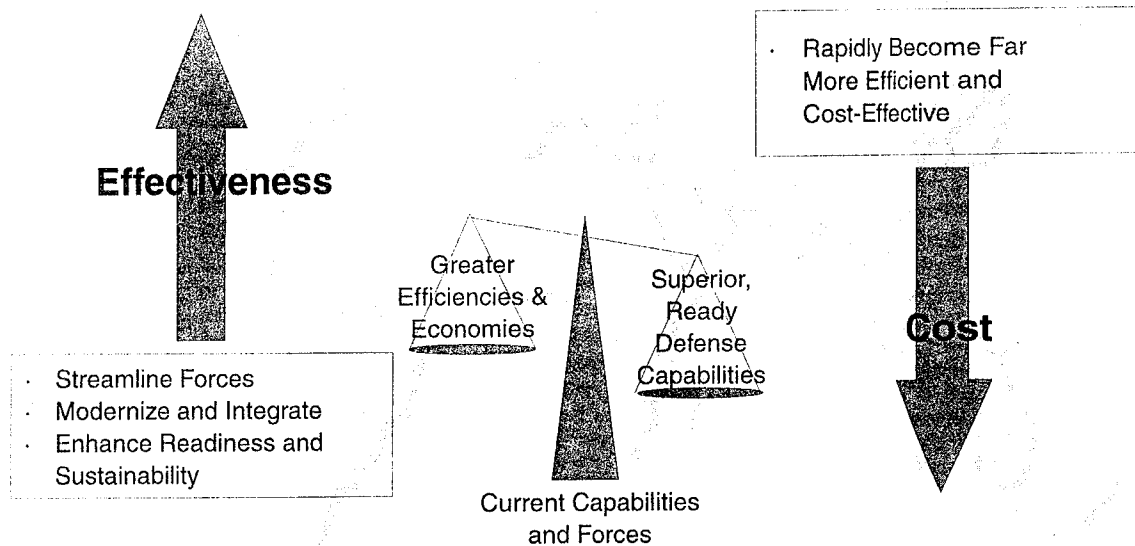
Efficiencies and economies enable DoD to invest its limited resources in mission-effective capabilities

1 December 1994

(Industry Lessons Learned)

- Build a culture that fosters innovation and initiative

- "Break the mold" to redesign the enterprise

- Ground change in understanding of the business operations
  and the needs of customers and consumers
  – Link strategies to detailed analysis and implementation

- Build a learning organization

- Let line managers and workers lead re-engineering
  – They are the functional experts (IT people can facilitate)

- Empower people - they make it happen

59

- Must have a vision, sponsorship, and concrete guidance from top leadership
  - Eliminate, standardize, consolidate, leave along, continuously improve, start from scratch
  - Focus on removing constraints that limit speed, flexibility, and quality

- Must do a strategic analysis
  - Fundamentally linked to business and operational substance and realities

- Must have compelling business case
  - Grounded in customer expectations and strategic goals

- Must get leadership "buy-in" and enthusiastic support
  - Mobilize resources and remove barriers

- Must maintain focus and commitment until goals are achieved
  - Tactically flexible but unwavering in strategic direction

1 December 1994

ITAA Report July 1993

1. Establish ownership by SECDEF and DEPSECDEF.
2. Create a fully funded, full time EI staff within the office of the DEPSECDEF.
3. Create the strategic implementation plan.
4. Market the EI effort.
5. Implement the financial strategies.
6. Build upon DoD successes.
7. Bring the migration system planning to a close.
8. Establish benchmarks.

1 December 1994

RECOMMENDATION: Establish Ownership by SECDEF and DEPSECDEF

Action: DEPSECDEF Memo 06 April 94 "Management Structure for Accelerated Implementation of Migration Systems, Data Standards, and Process Improvement"

Established the EI Executive Board and the EI Corporate Management Council "These management forums will be responsible for making decisions that allow the DoD to transition to cross-functional and integrated processes, data, and supporting information systems."

1 December 1994

Enterprise Integration Corporate Management Council

- Enterprise Integration
- Comptroller of the DoD
- ASD(Reserve Affairs)
- DUSD(Policy)/Chief of Staff
- DUSD(Environmental Security)
- Director, J-6
- PDUSD(Acquisition and Technology) Co-Chairman
- ASD(C3I) Co-Chairman
- USA
- USN
- USAF
- Mildeps as nominated by Service Secretaries
- DASD(Information Management) Executive Secretary
- USD(Personnel and Readiness)
- ASD(Health Affairs)
- Director, Program Analysis and Evaluations
- DUSD(Acquisition Reform)
- DUSD(Logistics)

RECOMMENDATION:
Market the EI Effort

Action: Enterprise Integration office within DISA is charged with orchestrating the effort within DoD.

Functionals are in charge of formulating their plans and exacting their funds.

1 December 1994

RECOMMENDATION:
Implement the Financial Strategies

Action: Establish a set of criteria for CIM's Central Fund.

Funds are allocated based on FEAs...

DoD Enterprise Integration

- The DoD Enterprise view (programmatic integration)
  - Planning and programming strategically and across functions
  - Sharing/shifting resources among organizations/reusing assets in more productive activities

- Functional Process Reengineering initiatives (functional integration)
  - Taking a DoD Enterprise perspective on all activities
    - **Aligning the Enterprise around end-to-end core processes**
  - Eliminating duplication and bottlenecks aggressively

- Shared data initiatives (data integration)
  - Standardize data
  - Use data as a corporate resource to link functions and information systems

- Evolve to a Defense Information Infrastructure (technical integration)
  - Common migration systems to leverage existing information resources
  - Standards based, open operating environment
  - An "Information Utility" supporting all DoD

(Functional Integration)
Functional Process Improvement Initiatives

FINANCE

HEALTH

TRANSPORTATION

C2

OTHERS

End to End Core Non-Duplicative, Enterprise Processes

1 December 1994
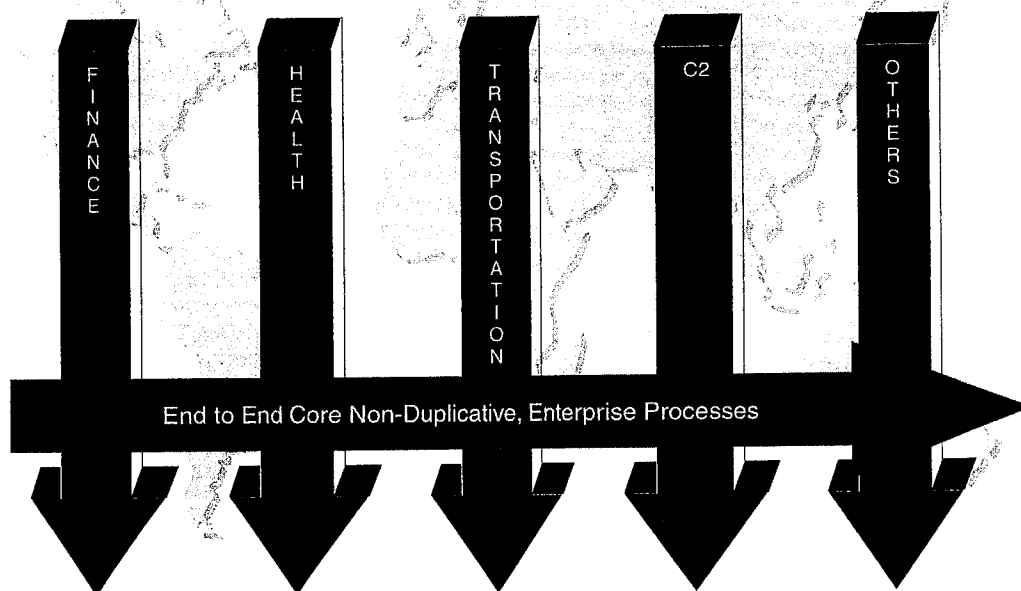
CIM- SYSTEMS ENGINEERING FOR MIGRATION SYSTEMS
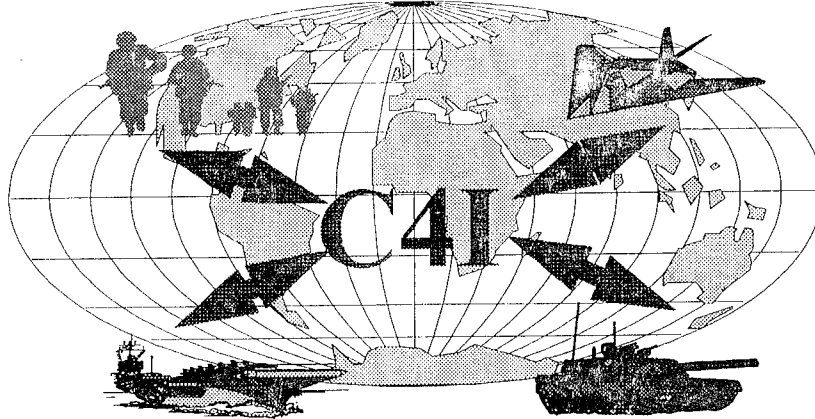
C4I--the tie that binds

Presented by:
RADM J. A. Gauss
Defense Information Systems Agency
Dep Dir for Engineering & Interoperability

THE CHALLENGE

- **Everything D6/JIEO/JITC does will directly support the Joint Service Warfighter**
  - Global Command and Control System
  - Defense Information Infrastructure
- **As the Defense Department downsizes and the Defense Budget evaporates, we must:**
  - Change the way we do business
  - Organize for maximum efficiency
  - Eliminate all duplication of effort
  - Provide quality, yet affordable, systems to our Warfighting customers

DII Architectural Framework
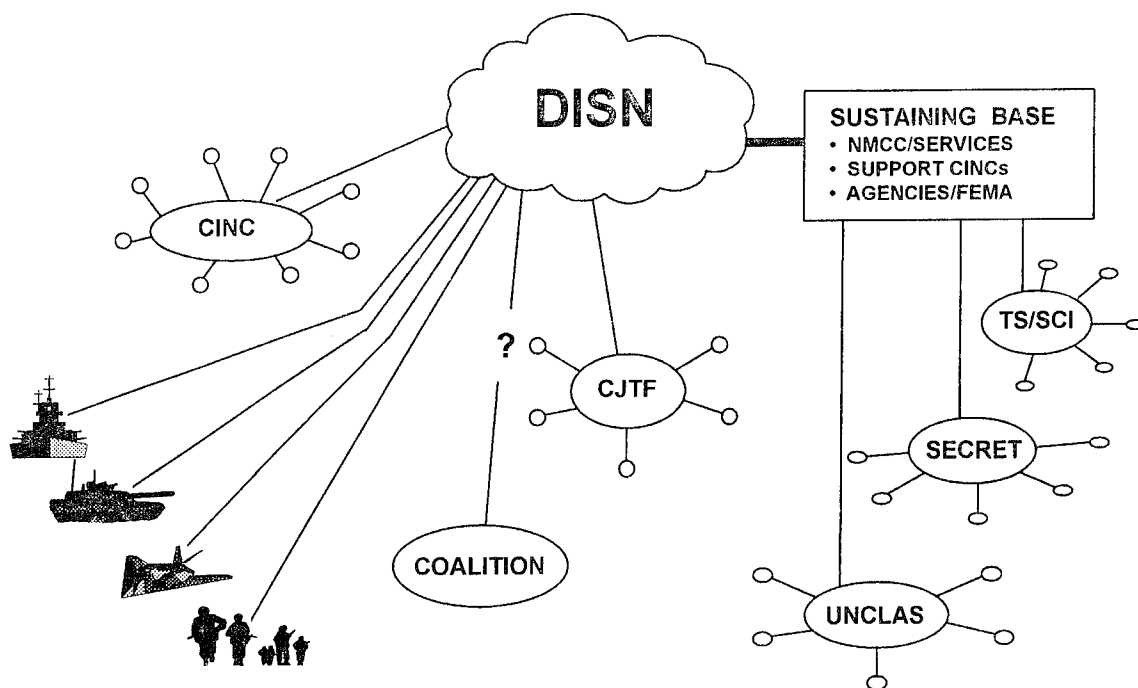
DII End-User Architecture
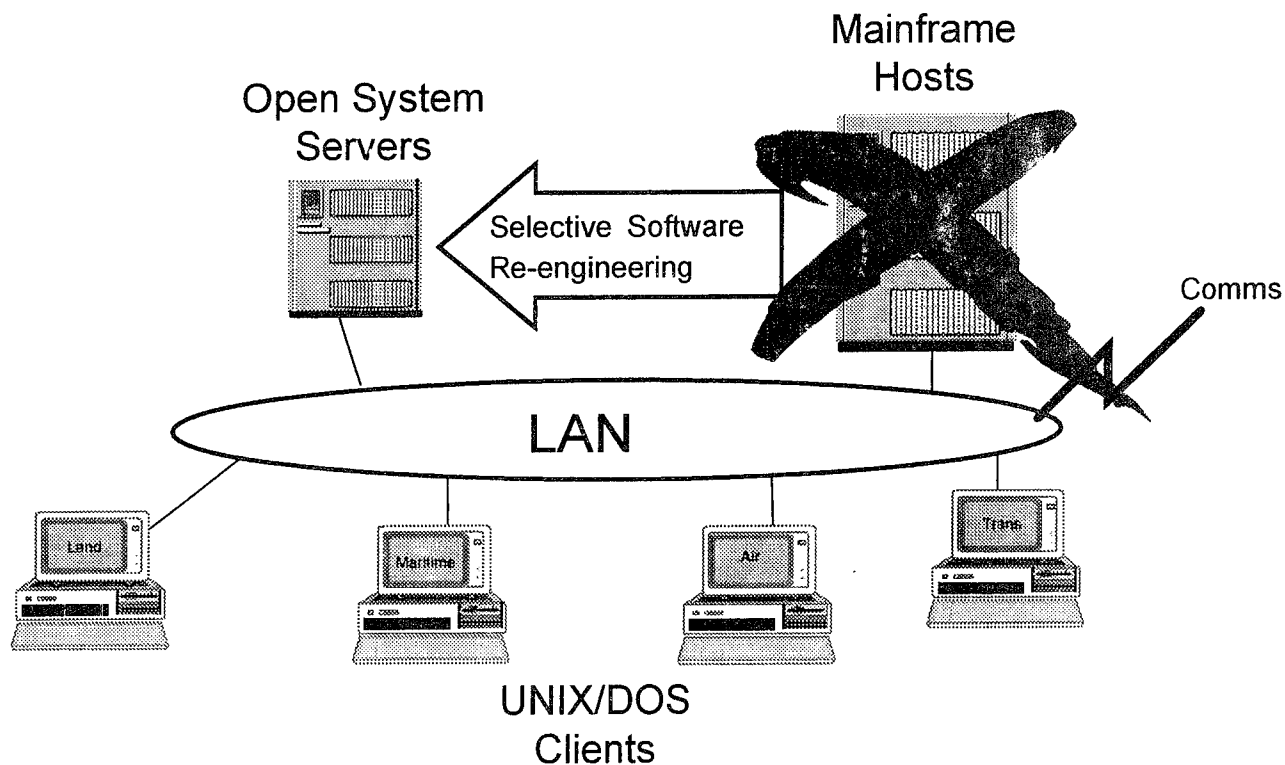
The TAFIM & GCCS
Software Development Environment
(The Keys To Success)
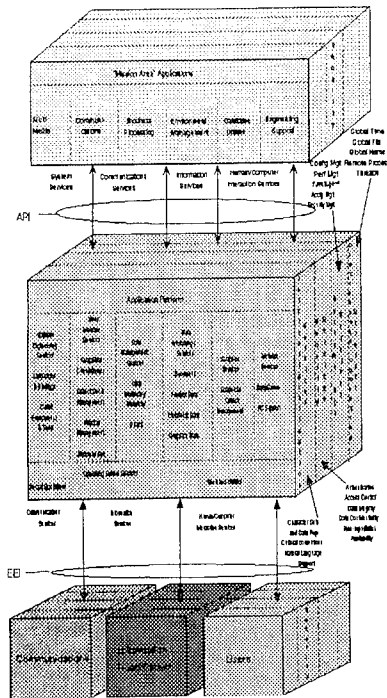
- **Integration Standard (4 Nov 94)**
- **GCCS Baseline COE (28 Nov 94)**
  - Architectural Guidelines
  - Common Operating Environment (13 of 19 Modules)
  - Application Programmer Interfaces
- **User Interface Specification (4 Nov 94)**
  - Style Guide
- **Software Tools (29 Nov 94)**
  - GCCS Online Access Library (GOAL)
  - Development Integration Tools
  - Runtime Integration Tools
- **Executables and Libraries (Solaris & HP)**

GCCS COE

| JOINT | MARITIME | LAND | AIR | READINESS | ARPA | SOF |

Mission Applications

COE

Standard Application Program Interfaces

COE Support Applications

| Multi-media (Mapping, Briefing Supt) | Communications (AMHS, E-Mail Conferencing) | Business Processing (Office Automation) | Environment Management (Executive Manager) | Data Base Utilities (Data Access) |

COE Platform Services

Standard Application Program Interfaces

| Programming Services (Ada, COTS) | User Interface Services (X-Windows) | Data Management Services (SQL, IRDS) | Data Interchange Services (ODA/ODIF) | Graphics Services (GKS, PHIGS) | Network Services |

Open Systems Conformant

Operating System Services

External Environment Interfaces (+ Middleware)

Comm Links

Data Bases

DISN

Development Environment

OBJECTIVE GCCS COE

MARITIME	JOINT	INTEL	LAND	AIR

Mission Applications

GCCS COE

UNIX Operating System, X-Windows, MOTIF

EVOLUTIONARY PATH
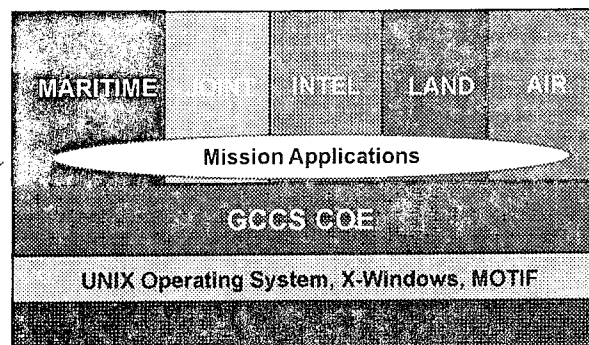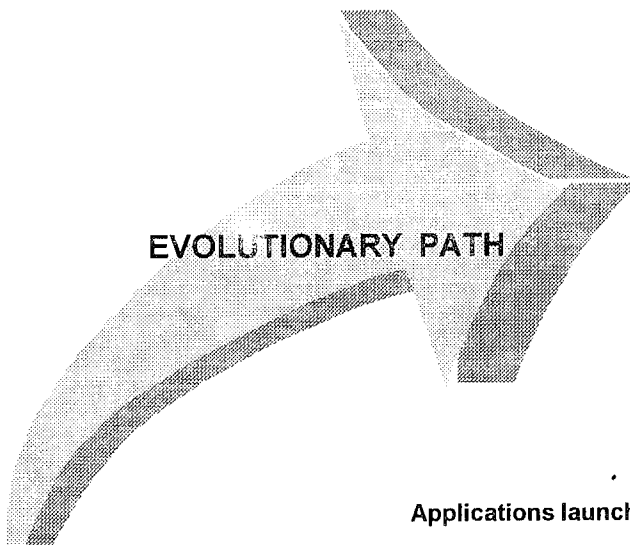
Applications launched using COE desktop

DESK TOP/GUI

Navy & Marines	STACCS	UCCS	AWIS	DODIIS	CTAPS	Sensors

COE

CASS

UNIX Operating System, X-Windows, MOTIF
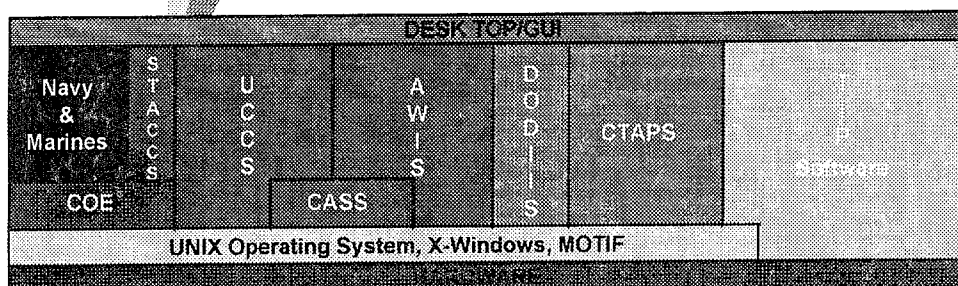
Integration Standard Plus Runtime Environment

Functionality Migrates to DII

DII Vision

"DII Migration System"

Fewer systems - All sharing DII COE compliant applications

Migration Selection

Functions	CINC	Services	Agency	Allied	Functional
A					
B					
C					
D					
E					
F					

DII COE

Today's Picture

Functions	CINC	Services	Agency	Allied	Functional
A					
B					
C					
D					
E					
F					

Multiple Operating Environments
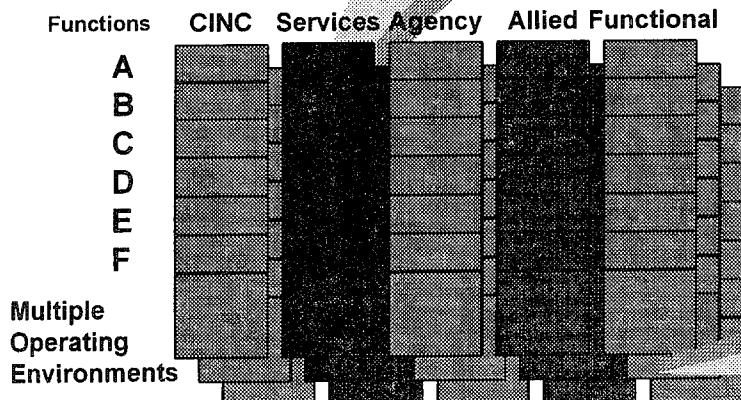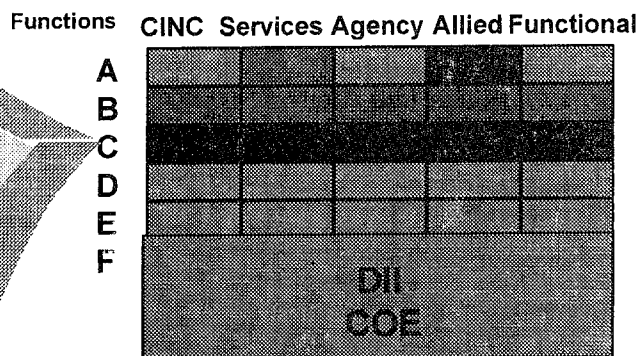
Mission Applications using one Common Operating Environment

Many Separate, Redundant Systems

JIEO ROLE

- **Define Standards more quickly**
  - "Plug the Loopholes"
- **Engineer systems**
  - Detailed system specifications
- **Security**
  - Engineer up front
- **Quality Software Development**
  - Policies, practices, and procedures
  - Products

JIEO ROLE (cont)

- **Product Assurance**
  - System integration testing
  - Configuration Management
  - Quality Assurance
- **Installation and In Service Support**
  - Training
  - Logistics
- **Teeth in our role as the DOD overseer of interoperability**
- **Must cross the gap between planning to migrate systems to actually migrating systems**
  - Next logical step for CIM
  - Get some real "System Kills"

THE ADVENTURE

■ **Not for the "Faint of Heart"**
- Will take high risk ventures when the gain exceeds the risk

■ **Not for the "Inflexible"**
- Will change course in the presence of new data

■ **"Get product out the door" & "I want it, now"**
- Insert current technology when necessary

■ **Leverage Uniformed Services' investment**
- Mobilization: ARMY
- Large Air Campaigns: AIR FORCE
- Expeditionary Warfare: NAVY/MARINE CORP TEAM

■ **Must be tough & demanding but not threatening**
- Capitalize on Uniformed Services' industrial capabilities
- Do work when Services have no requirement to do so

FUNCTIONALS AND RESOURCES PANEL

PANEL MODERATOR: CYNTHIA KENDALL
DASD (IM)
OASD (C3I)

FUNCTIONALS AND RESOURCES PANEL

LOGISTICS	MG JAMES KLUGH, USA (RET)	DEPUTY UNDERSECRETARY OF DEFENSE (LOGISTICS)
FINANCIAL	MR. RICHARD KEEVEY	DEPUTY UNDERSECRETARY OF DEFENSE (FINANCIAL SYSTEMS)
HEALTH AFFAIRS	MG GEORGE ANDERSON, USAF	DEPUTY ASSISTANT SECRETARY OF DEFENSE (HEALTH SERVICES OPERATIONS READINESS)
INTELLIGENCE	MR. JIM DAVIDSON	OFFICE OF INTELLIGENCE SYSTEMS SECRETARIAT

DATA STANDARDIZATION STATUS*

APPROVED STANDARD DATA ELEMENTS	1,150
APPROVED PRIME WORDS	362
APPROVED GENERIC ELEMENTS	19
TOTAL	1,531
CANDIDATE STANDARD DATA ELEMENTS	716
CANDIDATE PRIME WORDS	287
TOTAL	1,003

*AS OF NOVEMBER 29,1994

MIGRATION SYSTEMS SELECTIONS

- LIST OF MIGRATIONS SYSTEM SELECTIONS ISSUED - OCTOBER 28, 1994

- 188 MIGRATION APPLICATIONS AND SUB-APPLICATIONS SELECTED FROM 1856 LEGACY SYSTEMS

- MUCH WORK CONTINUES:
    - FURTHER MIGRATION SYSTEM SELECTIONS
    - FUNCTIONAL ECONOMIC ANALYSIS
    - IMPLEMENTATION PLANS

BUSINESS PROCESS REENGINEERING (BPR)

- APPROXIMATELY 130 BPR PROJECTS INITIATED
  - 1420 BUSINESS PROCESS IMPROVEMENTS IDENTIFIED
  - OVER 30 PROJECTS REACHED FUNCTIONAL ECONOMIC ANALYSIS STAGE

- BARRIERS TO IMPLEMENTATION
  - MANAGERIAL COMMITMENT
  - AVERSION TO CHANGE
  - IDENTIFYING PERFORMANCE MEASURES
  - FUNDING (INVESTMENT AND SAVINGS)

- NEXT CHART PROVIDES INSIGHT TO IMPLEMENTATION PROGRESS

Analysis of CIM Improvement Opportunities
by Improvement Category and Implementation Status

*302 Improvement Opportunities Sampled
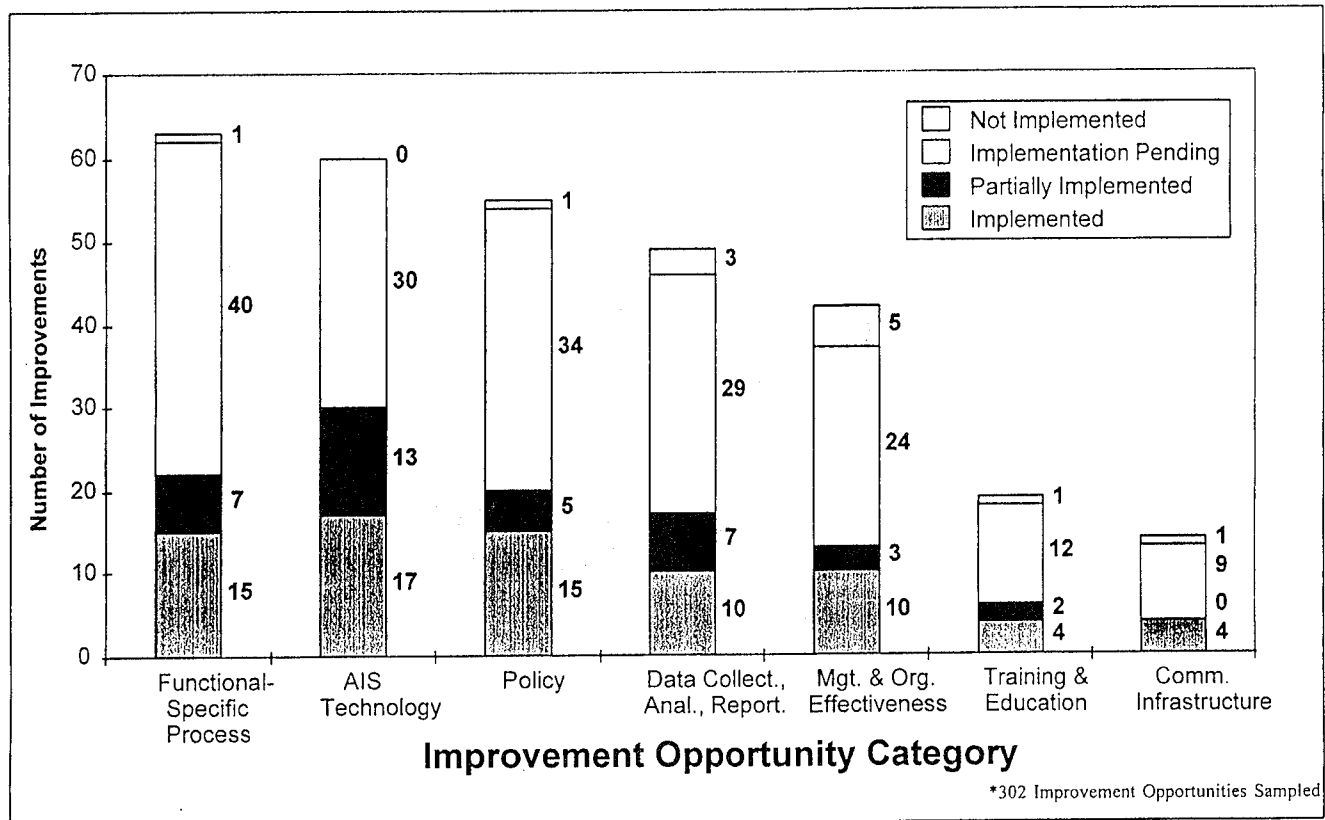
Department of Defense
Logistics Business Systems

Corporate Information
Management
and
Enterprise Integration Symposium
December 13 - 14, 1994

James R. Klugh
DUSD (Logistics)

The Changing DoD Mission

DIFFERENT KIND OF WAR →

DIFFERENT KIND OF LOGISTICS

1998
- Third world conflict / humanitarian relief
- Concurrent, rapid deployment missions
- Force structure
  - 325 Ships
  - 20 AF FWE
  - 15 Divisions
    - °
    - °
    - °
- Joint operations

1986
- Cold War
- Large scale, sustained missions
- Force structure
  - 600 Ships
  - 40 AF Wings
  - 28 Divisions
    - °
    - °
- Coordination between Services

Challenges
1) Readiness
2) Responsiveness
3) Sustainability
4) Interoperability

2

Changes inTraditional Logistics Relationships

PAST   **PRESENT**

| Maintenance Personnel | Supply Units | Transportation Modes | Maintenance Personnel | Supply Units | Transportation Modes |
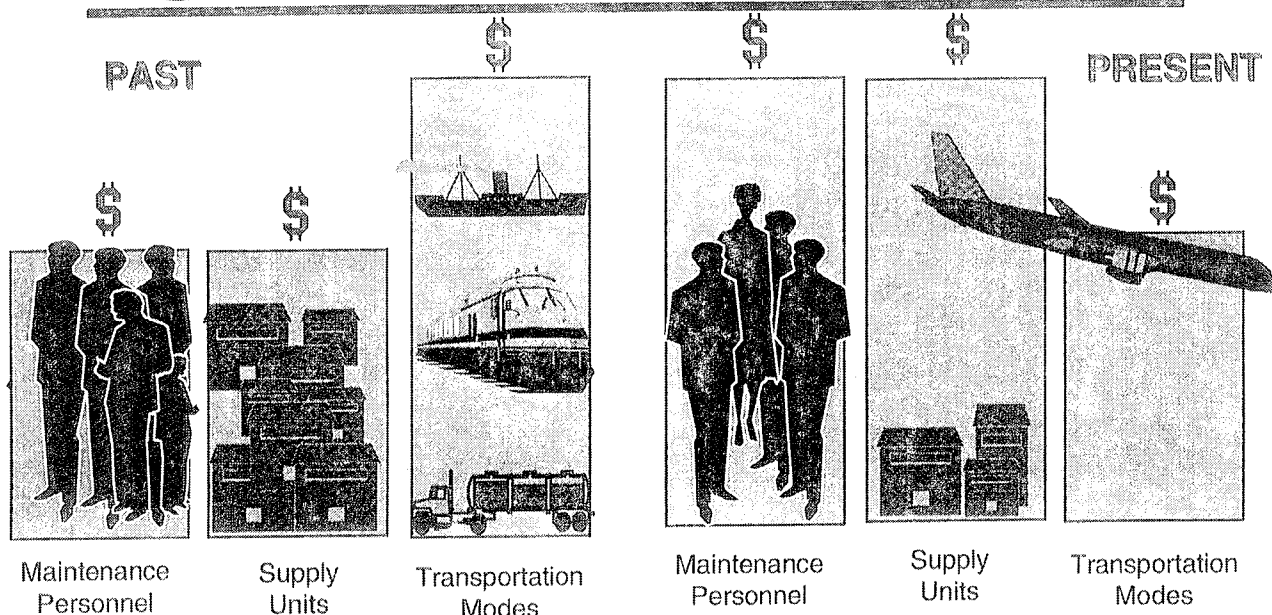
- Maintenance people were plentiful and inexpensive
- Supply spares were log-tech, plentiful and inexpensive
- Transportation/processing was slow, unreliable and expensive

- Maintenance people are less plentiful and expensive
- Supply spares are hi-tech, less plentiful, and expensive
- Transportation/processing is fast, reliable and less expensive

51

Annual Value of Logistics Business

Base Level Inventory
$24B

National Inventory
$77B

Annual Operating Cost
$44B

Total
$145B

3
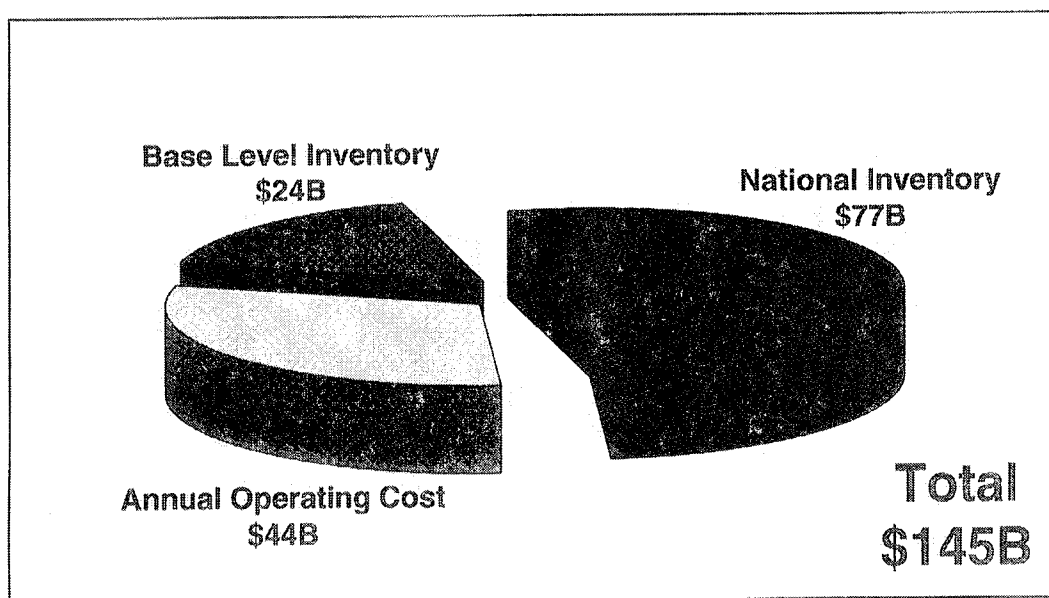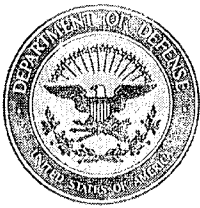
National Level Logistics

Annual Budget

Depot Maintenance
(organic and contract
DBOF)
$15B

Supply
$19B

Transportation
$10B

**Total
$44B**
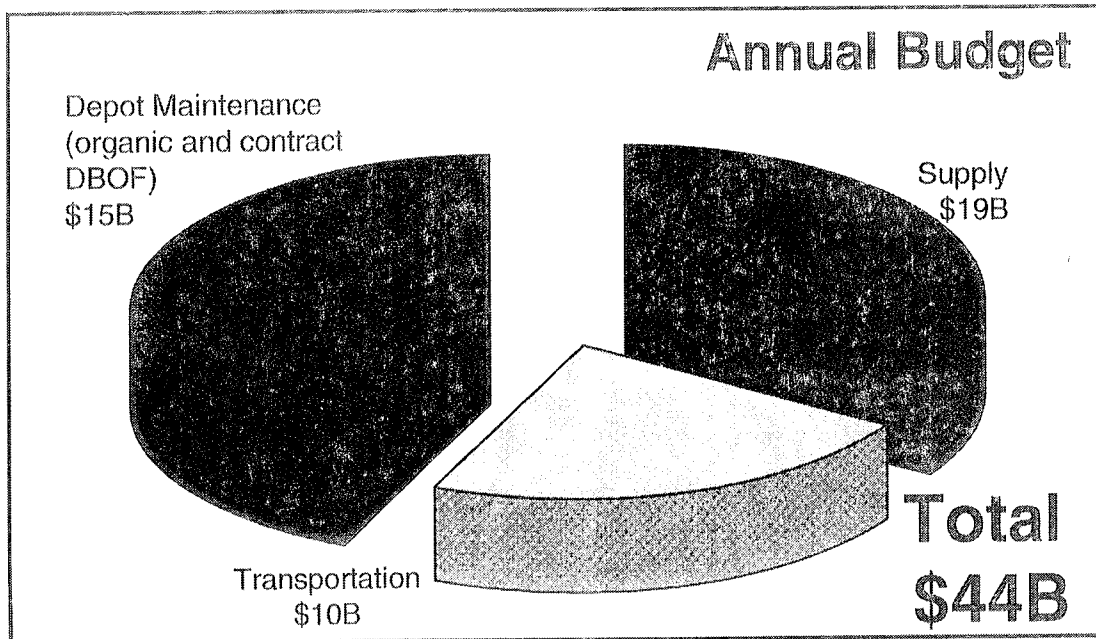
4

Central Logistics Personnel

Maintenance Depots
117K

**Total
199.7K**

Transportation
30K

Supply ICPs
32.5K

Supply Depots
20.2K
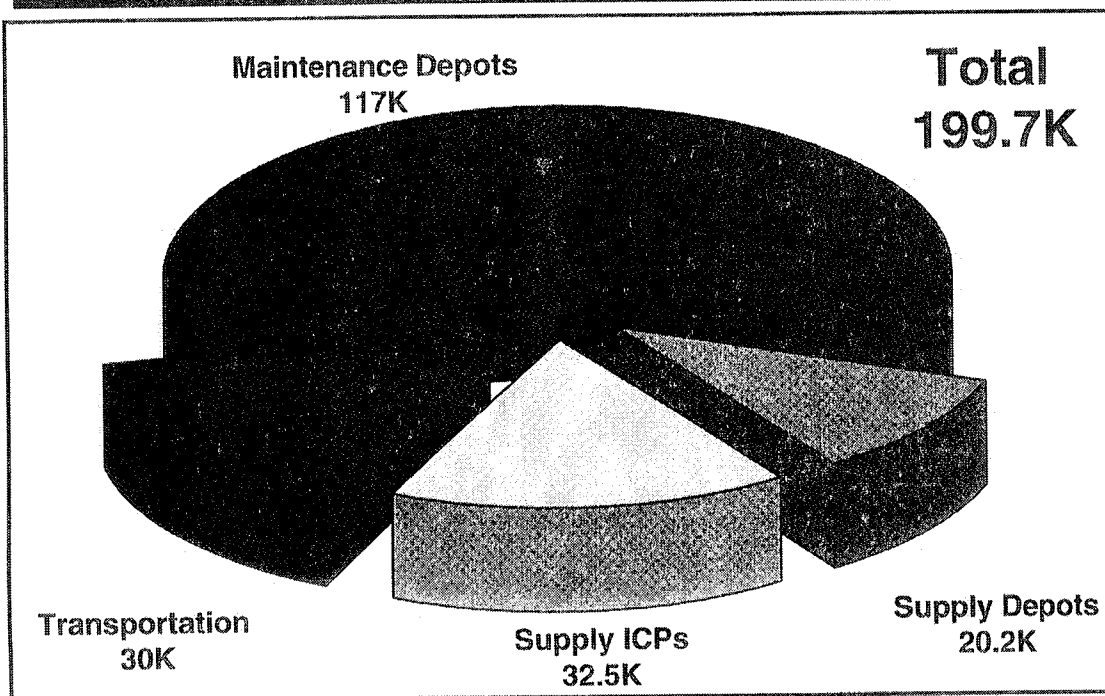
5

Significance of Leadtimes to Readiness

- **Decisions affecting sparing and maintenance capability often occur 2 - 3 years before impact is seen**
  - ➤ Force structure changes
  - ➤ Information Systems provide few lead indicators
  - ➤ Historically, mission changes mismatch advanced spares purchases & readiness results

11

Logistics Corporate Information Management

Logistics Systems	Interfaces

Materiel Management

Medical Logistics

Distribution

Depot Maintenance

Transportation

Environment

Personnel

Financial

Procurement

1

The CIM Modernization Process

- Many Systems ——→ Few
- Old Process ————————————————→ Re-engineered
- Old Architecture ——————————————————————→
- Old Technology

- Open System --
- Separation of Data & Applications

15

How It's Being Done

Involving the customer in the process — Joint teams and forums	• JLSC is catalyst and facilitator • Customer concurrence and buy-in
Leading with process change — Joint concurrence on approach and strategy	• Greatest benefits are in process changes • Systems are a critical sustaining mechanism
— Open systems DISA standards/protocols	• Platforms for future functional enhancements/upgrades • Architecture to support DOD migration • Exploitation of digital data
Focusing on implementation vs. development — Existing government and commercial applications	• Select deployable systems • Get them to the users now • Deliver payback now
Changing minds as well as systems — Focused change management strategy	• Services abandon paradigms • Adopt new ideas, practices

16

INTERFACING ARCHITECTURE

CONTR ADMIN

PROCUR

SCAP

SCAP

DISTRIB

STRAP

MATERIEL MGMT

CATALOG

STRAP

STRIP

STRIP

STRIP

RETAIL

DEPOT MAINT

DAAS

LOGISTICS READINESS CENTER

HAITI

SOMALIA

BOSNIA

EDI TRANSACTIONS			
735.9M PER YEAR	MILSTRIP	MILSTRAP	
61.3M PER MONTH	374M/YR	102M/YR	200M/YR
14.1M PER WEEK	7M/WK	2M/WK	4M/WK
2M PER DAY			MILSCAP
163 PER SECOND	34M/YR	25M/YR	193K/YR
	653K/WK	480K/WK	4K/WK

35

Size of the Information Problem

2.2B Logistics Transactions Per Year

1.5M Receipts from Procurement
8.5M Receipts from Customer Returns
30M Issues from Stock

$44B Annual Log Business

6.3M Catalogued Items

56B Logistics Systems (All Levels)

150K Customer Accounts

$77.5B Consumable and Reparable Inventory

6

Dependency on Logistics Systems Modernization

C3I Systems

Logistics/Transportation Sys

Applications | Data
Non-Financial Procedures | Logistics Data Base
Financial Procedures (Rcpt/Issue, Order, Release Suspend, etc.)
Production Management & Scheduling | GTN/ITV Data Bases

Procurement Systems
Pre-award Procedures | Post-award Procedures

Financial Systems | Disbursements/Collections
Financial System(s) | Other
Budget Exhibits | General Ledger | 1307

17

Materiel Management

Select System

Materiel Management

- Asset Management Area
  - Stock Control System (SCS)
  - Discrepancy Reporting System (DRS)
- Requirements Determination Area
  - Requirements Determination (RD)
  - Maintenance Planning & Execution (MP&E)
- Supply & Technical Data Support (S&TDS) Area
  - Configuration Management Information System (CMIS)
  - Product Definition Support System (PCTSS)
  - Provisioning & Cataloging Technical Support System (PCTSS)

Deployed Sites

- CAV, 14 Army, 6 Navy, 94 Contractors
- DESEX, 5 DLA, 3 Army, 2 Navy ICPs
- CMIS, 1 Army, 1 Marines, 1 Navy, 1 PMO

ROI

$5.10:$1

Based on FEA

18

Materiel Management Economic Opportunity

Source: Component Studies

Estimated Gross Savings
Investment

$.6 B

'93 '94 '95 '96 '97 '98 '99 '00 '01

(All figures in FY 93 M$s)

- Rapid roll out of small applications
  - CAV II
  - RPV
  - VMSIR
  - DESEX
  - SDF
- Low cost, quick return

The MMSS suite
Larger investment,
bigger return

Source: MM FEA, 1993

Estimated Gross Savings
Investment

$14.5 B

'93 '94 '95 '96 '97 '98 '99 '00 '01 '02 '03 '04 '05

(All figures in FY 93 M$s)

1

MM Legacy Cost Avoidance

	1993		1994		
	Requested	Approved	Requested	Approved	
USN	62.8	3.1	7.9	2.9	**OVER $470M IN REALIZED SAVINGS**
USAF	66.8	8.3	52.9	2.6	
DLA	95.2	4.1	22.4	2.2	
USMC	18.7	0.0	2.3	0.3	
USA	140.9	4.5	32.9	4.0	
Total	384.4	20.0	118.4	12.0	

NET 364.4   NET 106.4

OVER 180 DOCUMENTED
LEGACY APPLICATIONS

STOCK CONTROL SYSTEM

REQUIREMENTS COMPUTION SYSTEM

SUPPLY & TECHNICAL DATA SUPPORT

FUNCTIONALITY

Legacy

Legacy

Legacy

1960s   1970s   1980s   1990s   2000s

TECHNOLOGY

22

Depot Maintenance

Depot Maintenance Standard System (DMSS)

Selected System

- Baseline Advanced Industrial Management (BAIM)
- Programmed Depot Maintenance Scheduling System (PDMSS)
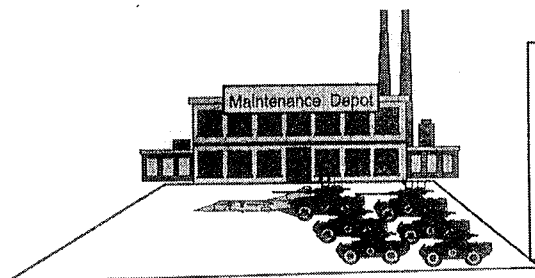- Depot Maintenance Management Information System (DMMIS)
- Interservice Maintenance Agreement Control System (IMACS)
- Hazardous Material Management System (DM-HMMS)
- Tool Inventory Management Application (TIMA)
- Enterprise Information System (EIS)
- Facilities and Equipment Management (FEM)
- Laboratory Information Management System (LIMS)

Maintenance Depot

Deployed Sites

- DMMIS - Ogden ALC QOTE&E
- IMACS - 2 Army, 3 Navy, 1 USMC, 5 AF
- PDMSS - 4 Army, 6 Navy, 5 AF
- HMMS - 4 Army, 2 USMC, 3 AF
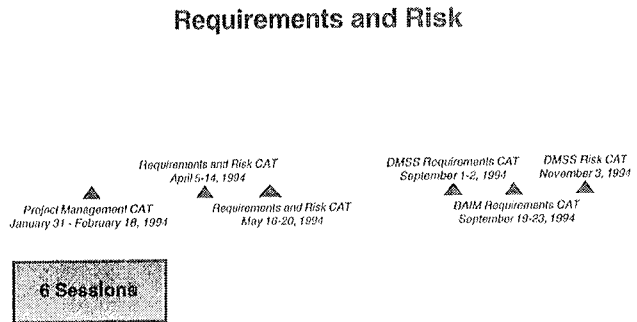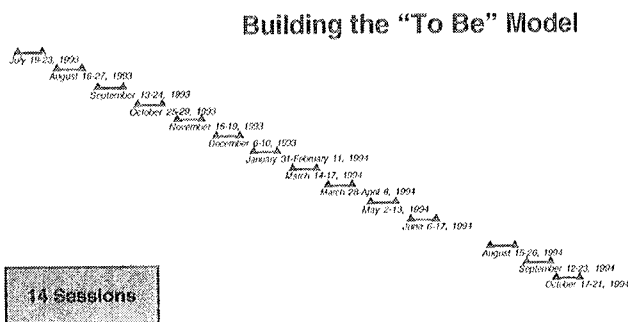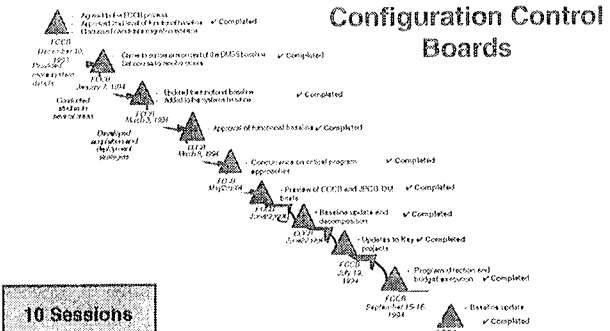- TIMA - 4 Navy
- EIS - 1 Army

Based on FEA

ROI

$4.70:$1

23

Customer Investment

Joint Policy Coordinating Group Depot Maintenance

September 1992
January 1993
March 1993
June 1993
September 1993
January 1994
March 1994
June 1994
September 1994

12 Sessions

Configuration Control Boards

10 Sessions

Building the "To Be" Model

July 19-23, 1993
August 16-27, 1993
September 13-24, 1993
October 25-29, 1993
November 15-19, 1993
December 6-10, 1993
January 31-February 11, 1994
March 14-17, 1994
March 28-April 6, 1994
May 2-13, 1994
June 6-17, 1994
August 15-26, 1994
September 12-23, 1994
October 17-21, 1994

14 Sessions

Requirements and Risk

Requirements and Risk CAT
April 5-14, 1994

DMSS Requirements CAT
September 1-2, 1994

DMSS Risk CAT
November 3, 1994

Project Management CAT
January 31 - February 18, 1994

Requirements and Risk CAT
May 16-20, 1994

BAIM Requirements CAT
September 19-23, 1994

6 Sessions

119410v1

15

Depot Maintenance Economic Opportunity

■ Estimated Savings
— Investment

FY93 $M

$3.7B
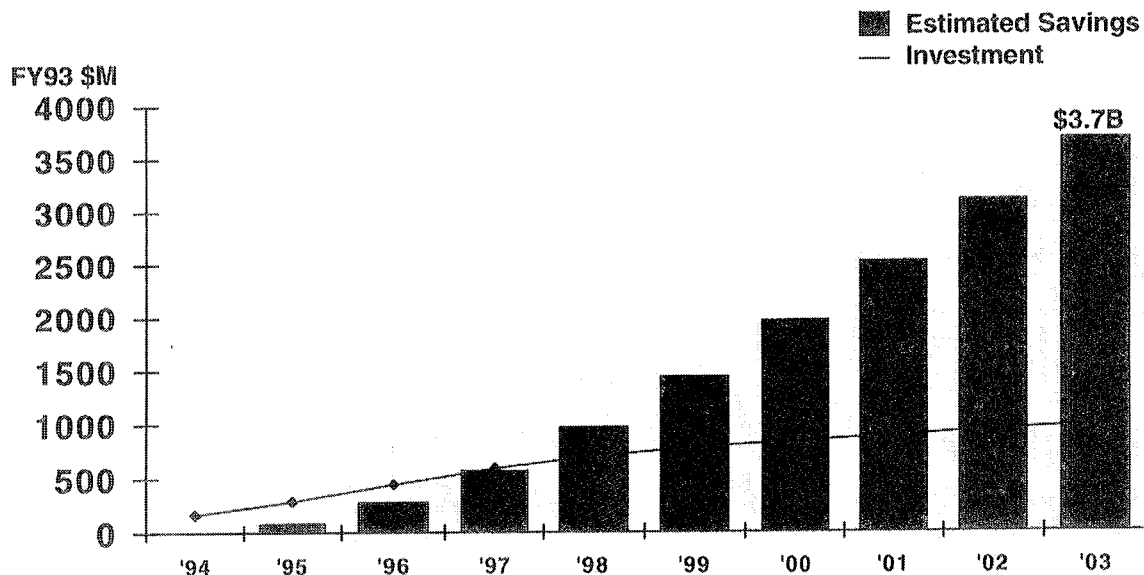
Source: Depot Maintenance FEA Version 2.0, October 1993
(Numbers include DMMIS, HAZMAT, PDMSS and TIMA)

Depot Maintenance Economic Opportunity

Source: DM FEA, 1993

$1.2B

- Estimated Gross Savings
- Investment

(All figures in FY 93 M$s)
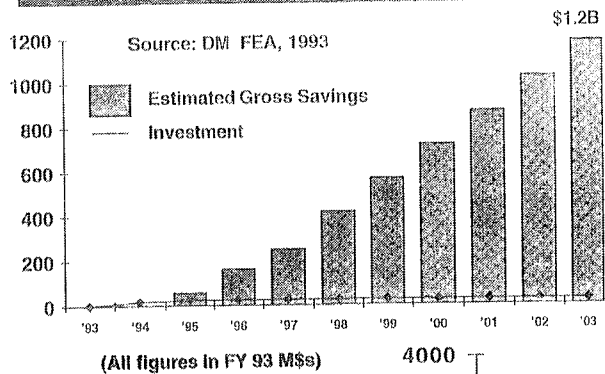
- Rapid roll out of small applications
  - PDMSS
  - DM-HMMS
  - TIMA
- Low cost, quick return

- DMSS (DMMIS, HAZMAT, PDMSS and TIMA)
- Larger investment, bigger return

Source: DM FEA, 1993

$3.7B

- Estimated Gross Savings
- Investment

(All figures in FY 93 M$s)
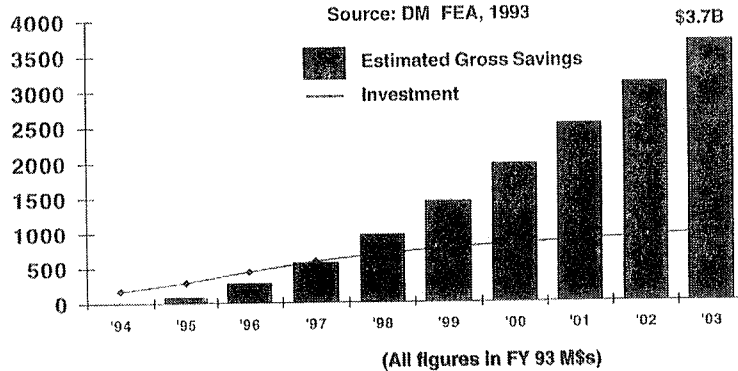
2

DM Legacy Cost Avoidance

	1993		1994	
	Requested	Approved	Requested	Approved
USN	32.1	9.3	26.7	0.7
USAF	64.6	0.0	17.7	1.4
DLA	0.0	0.0	0.0	0.0
USMC	0.0	0.0	0.0	0.0
USA	18.4	0.7	5.1	0.9
Total	115.1	10.0	49.5	3.0

NET 105.1   NET 46.5

OVER $150M IN REALIZED SAVINGS

Distribution

Distribution

System

• Area Oriented Dept/Modernization (AOD/MOD)

80% of DOD Dist Workload Under Dist Std Sys

Distribution

Deployed Sites

• In Production, Defense Depot New Cumberland
• Def Dist Region East and West 6 Site Implementation - CY94
• 12 Former AF and USA Sites in CY95
• 9 Former USN and USMC in CY96

Based on FEA → **ROI $3.05:$1**
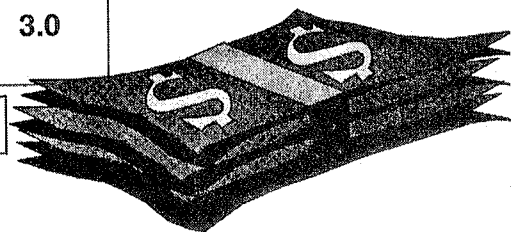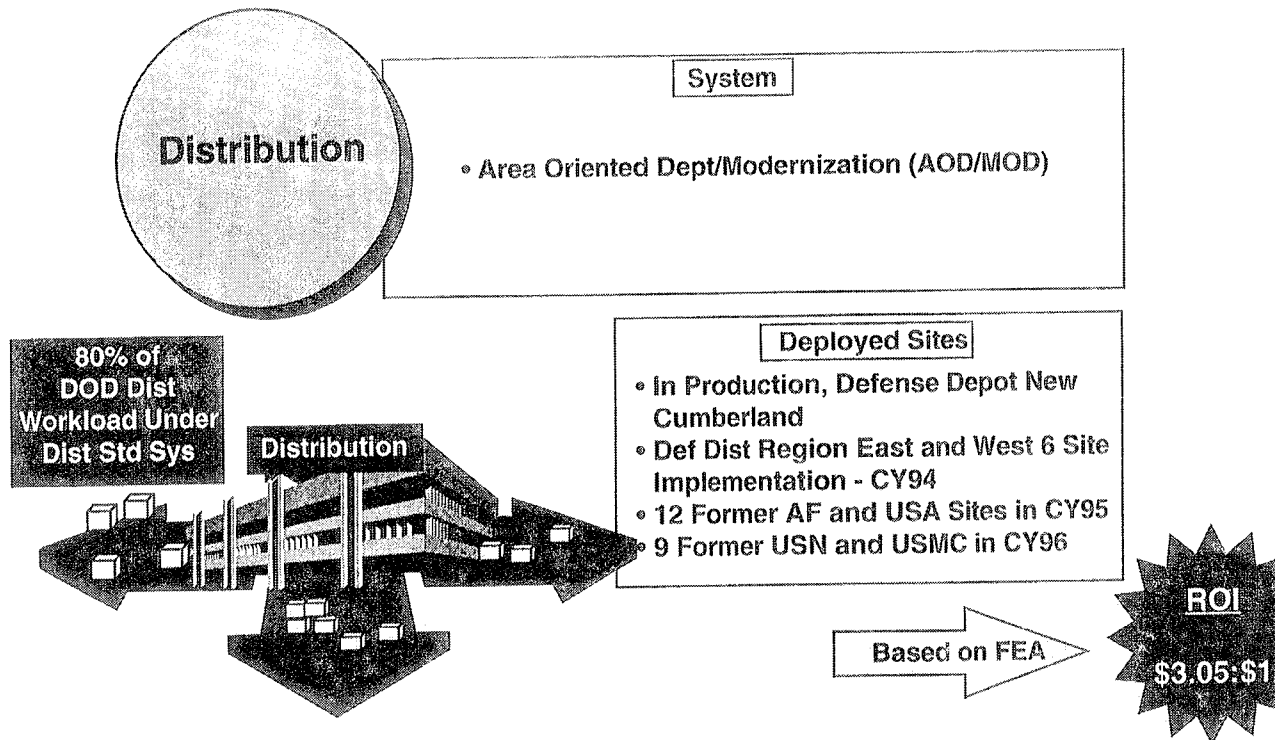
Benefits FY93 Constant $M

System Benefits
$343.7

CDA: 146.9

Other: 9.1

System Managers: 52.5   System Operators: 33.9

S/W Spt Contractors: 23.1

OTIS Maintenance: 78.2

Other:
COTS S/H: 18.1
Lower Tier H/W: 4.6
Base Support: 10.4
Telecommunications: -12.6
Replace Purchases: - 11.4

Mission Benefits
$246.4

Radio Frequency: 198.9

Process DRO: 1.3
Single Station: 11.8
Eliminate Paper: 2.5
Exception Cards: 3.7
Transport Billing: 8.8

Issued from Receipt: 19.2

DSS is a viable program that can return $3.05 for ever $1.00 invested
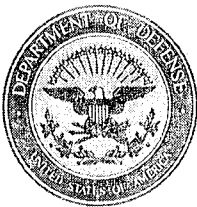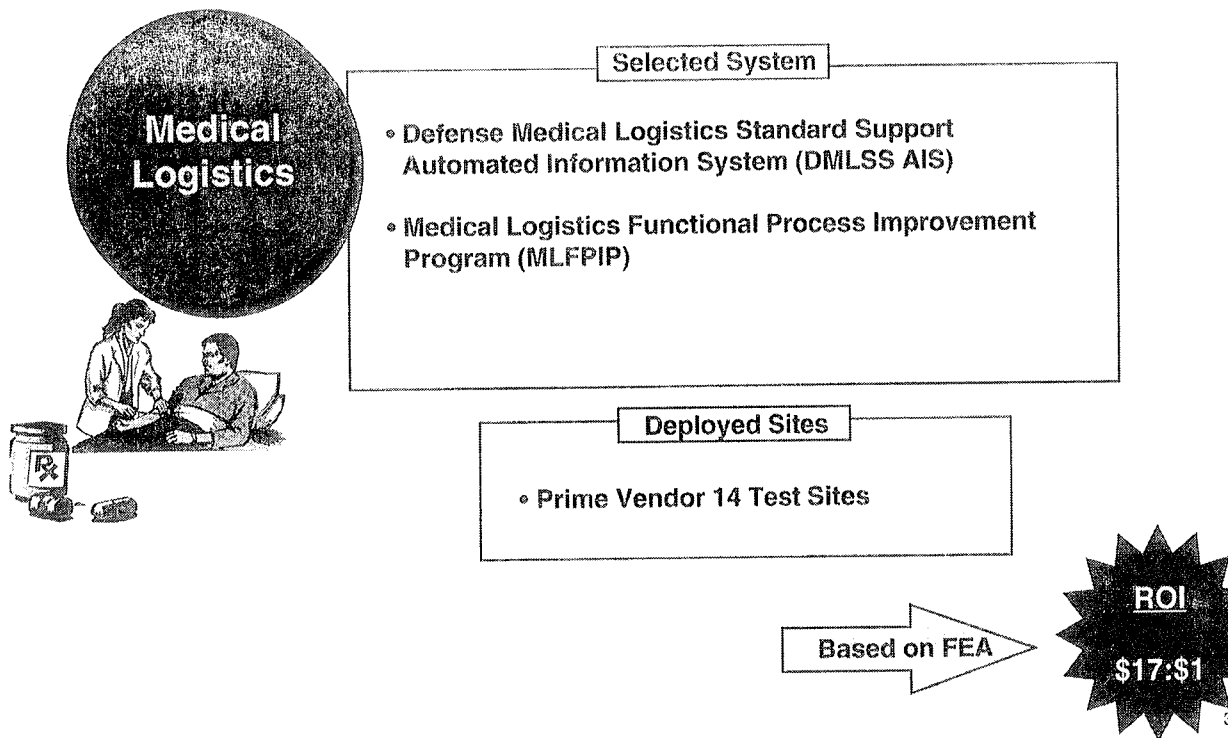
2

Medical Logistics

Selected System

- Defense Medical Logistics Standard Support Automated Information System (DMLSS AIS)

- Medical Logistics Functional Process Improvement Program (MLFPIP)

Medical Logistics

Deployed Sites

- Prime Vendor 14 Test Sites

Based on FEA → **ROI** **$17:$1**

DMLSS Integration

Non-Medical AISs

Medical AISs

DMLSS

- Logistics
- DFAS
- Contractors
- Engineering
- TMIS
- MHSS
- MHCMIS
- CHCS
- MEPRS

Depot Stocked Items

Direct Vendor Delivery

Local Purchase Items

Present ─────────────────────────► Future
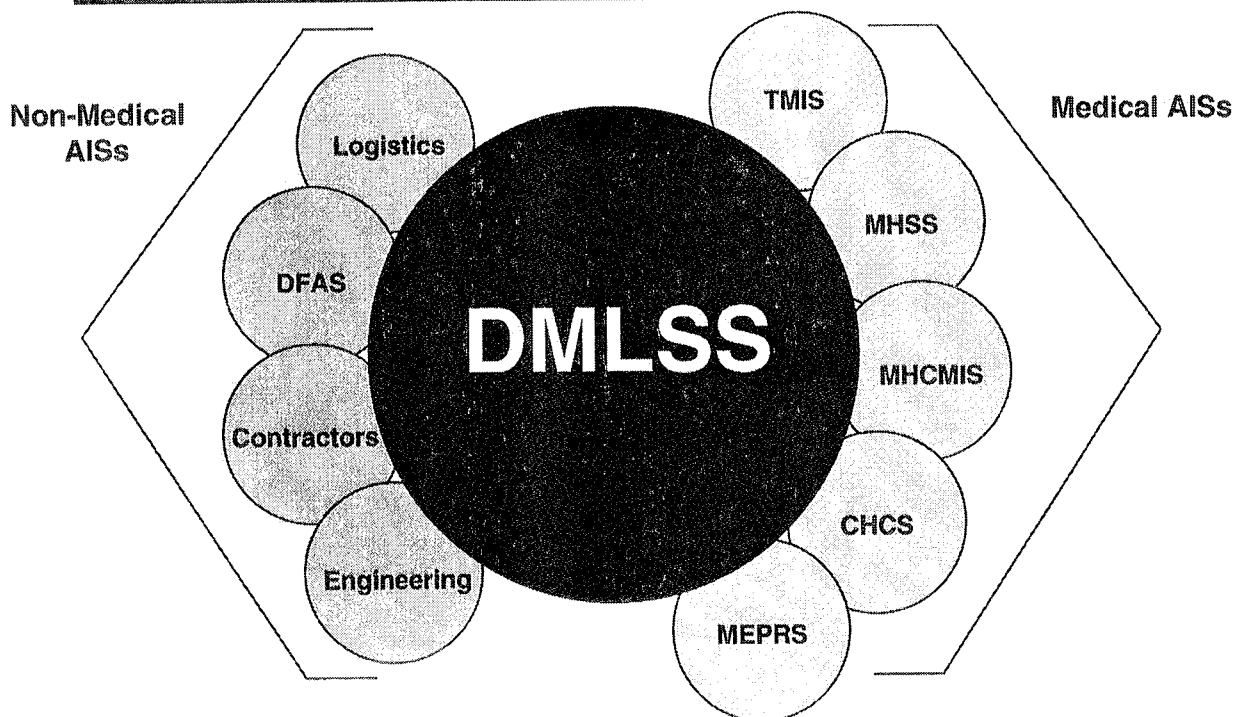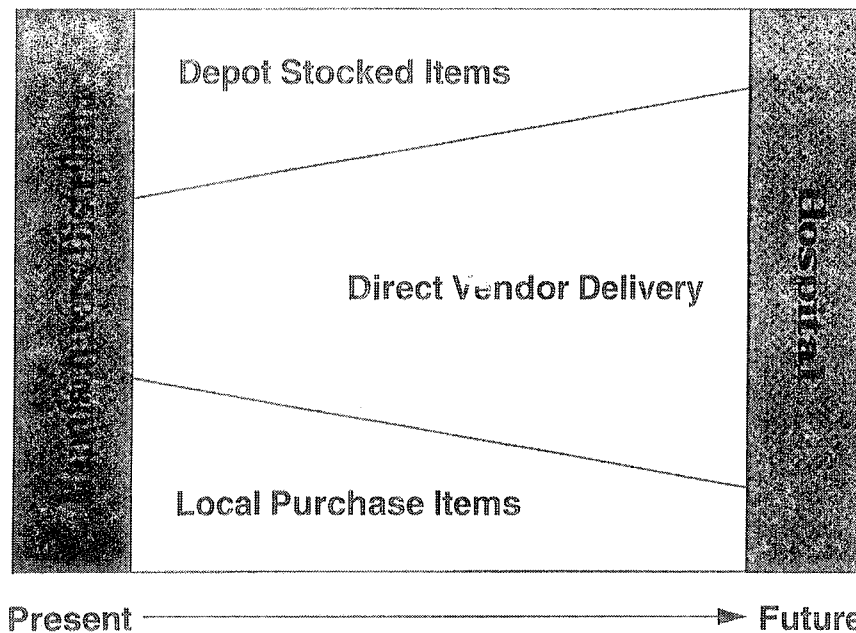
Transportation CIM Status

Transportation

Functional/Selected System

- Port Management
  - Worldwide Port System (WPS)
- Traffic Management Officer Functions
  - Trans Officer Personal Property System (TOPS)
- Load Planning (Vehicle, Ship, Rail, Aircraft)
- Theater Trans Operations
- Unit Move
- Mode Clearance
- Transportation Planning/Execution (CINC Level)
  - Global Trans Network (GTN)
- Transportation Financial Management
- Other
  - Defense Transportation Tracking System (DTTS)
  - Relational Naval Air Logistics Info System (RNALIS)

Deployed Sites

- WPS, 6 Seaports (EUCOM, PACOM)
- TOPS, 260 CONUS sites
- DTTS, Operational - CONUS surface moves
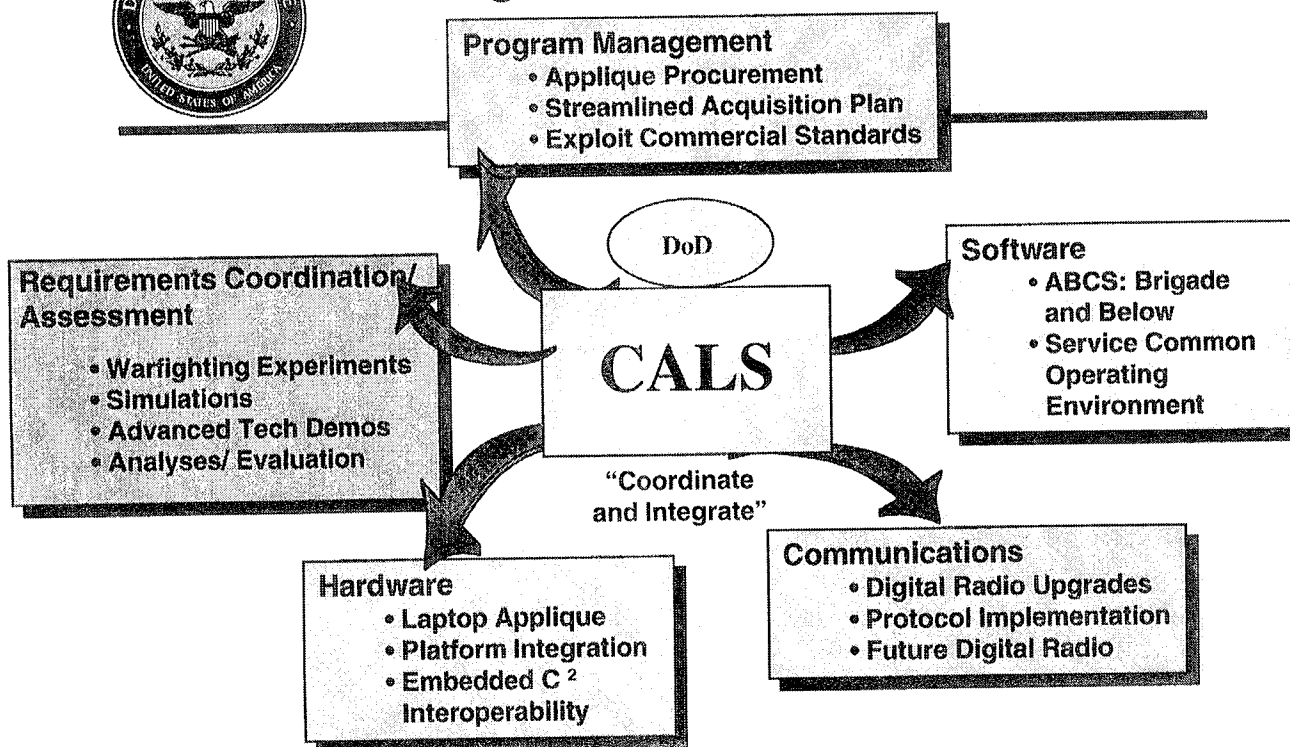- GTN, 1000 users
- RNALIS, 7 Navy/USMC sites

Application of CALS Philosophy in the Logistics Process

CALS is a CORE strategy to use integrated data through a set of standards to achieve efficiencies in business and operational mission areas of the Department of Defense
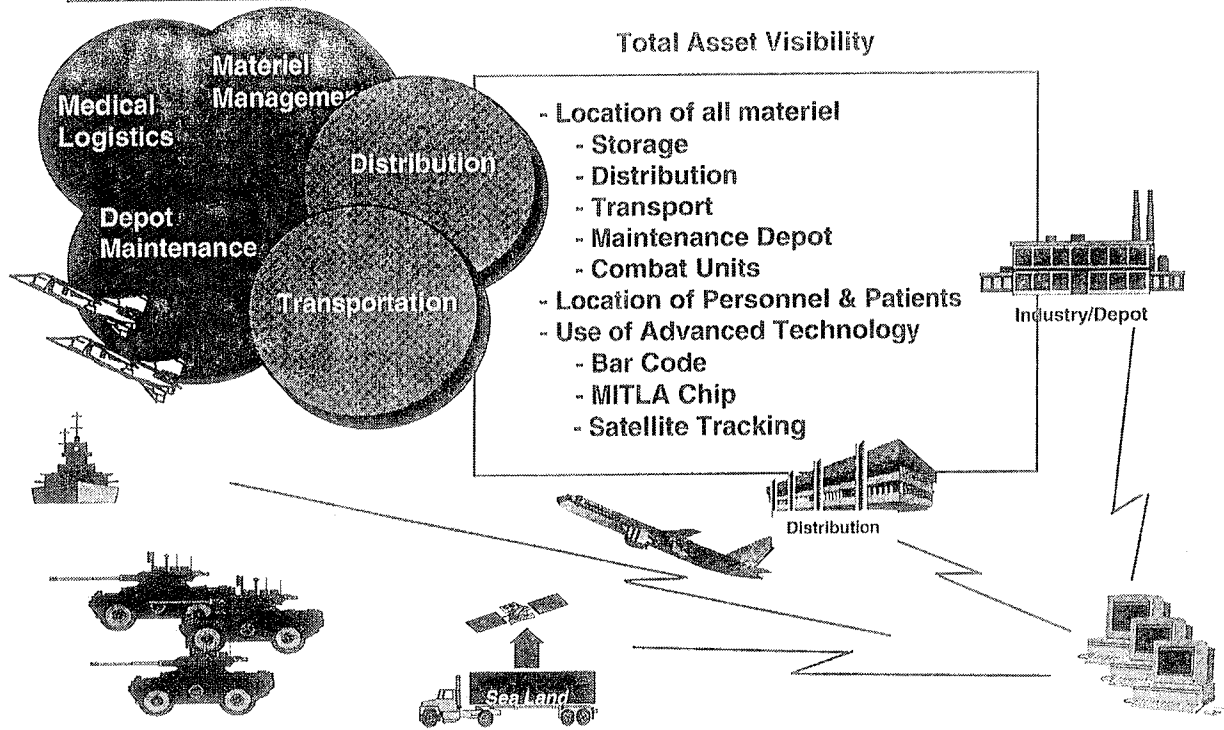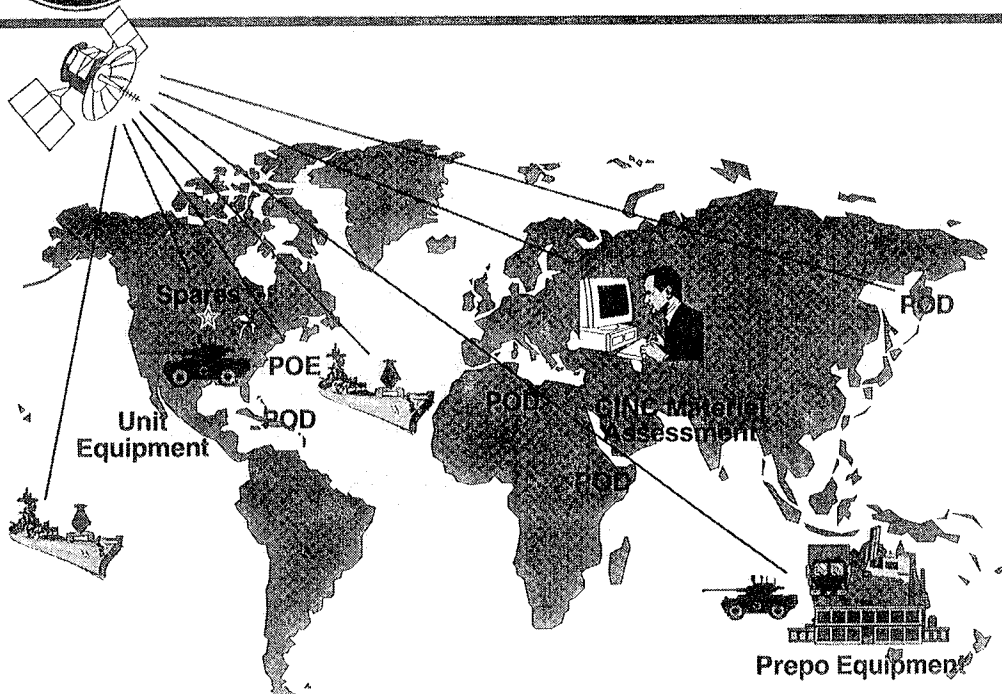
Putting It Together

Program Management
- Applique Procurement
- Streamlined Acquisition Plan
- Exploit Commercial Standards

Requirements Coordination/ Assessment
- Warfighting Experiments
- Simulations
- Advanced Tech Demos
- Analyses/ Evaluation

DoD

CALS

"Coordinate and Integrate"

Software
- ABCS: Brigade and Below
- Service Common Operating Environment

Hardware
- Laptop Applique
- Platform Integration
- Embedded C ^{2} Interoperability

Communications
- Digital Radio Upgrades
- Protocol Implementation
- Future Digital Radio

Total Asset Visibility

Total Asset Visibility

- Location of all materiel
  - Storage
  - Distribution
  - Transport
  - Maintenance Depot
  - Combat Units
- Location of Personnel & Patients
- Use of Advanced Technology
  - Bar Code
  - MITLA Chip
  - Satellite Tracking

Medical Logistics

Materiel Management

Distribution

Depot Maintenance

Transportation

Industry/Depot

Distribution

Sea-Land

TAV Challenge

Spares

POE

POD

Unit Equipment
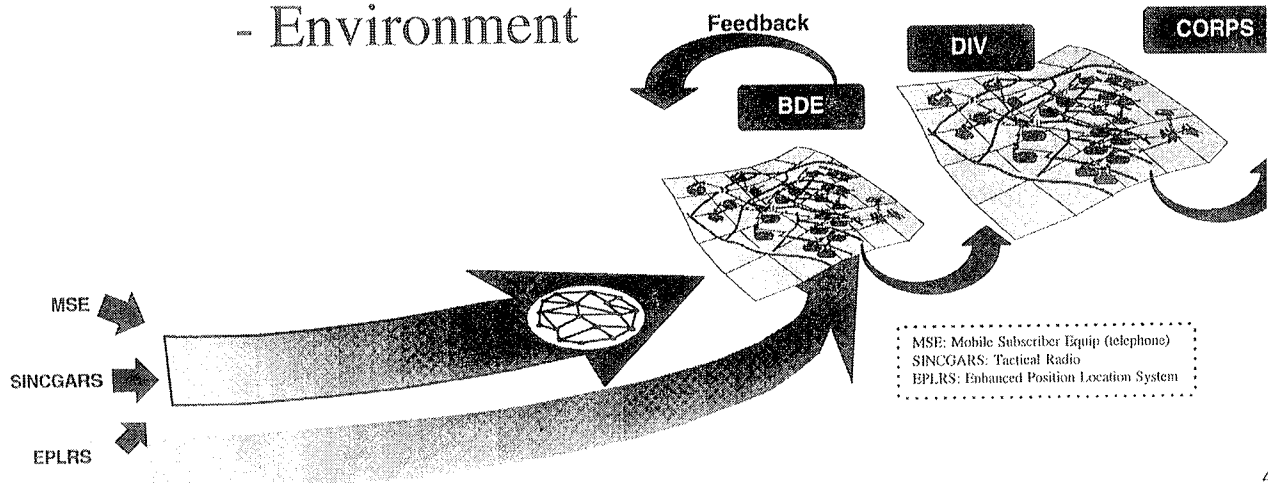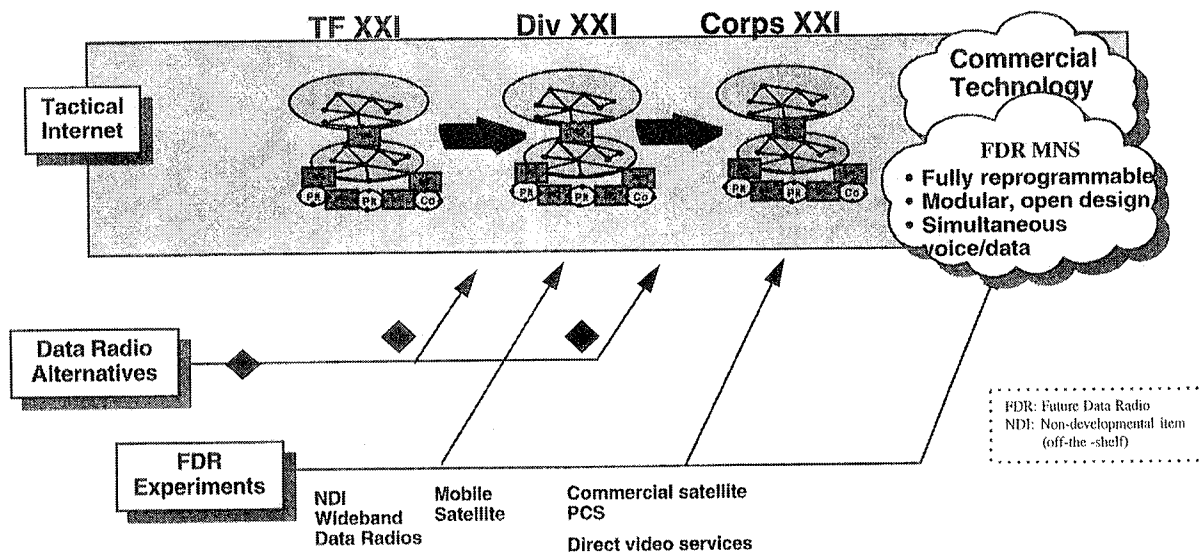
POD

PODS

CINC Materiel Assessment

POD

Prepo Equipment

4

Objective of Logistict Business Systems in the Modern Battle Field

- Control:
  - Battle Space
  - Operations Tempo
  - Environment

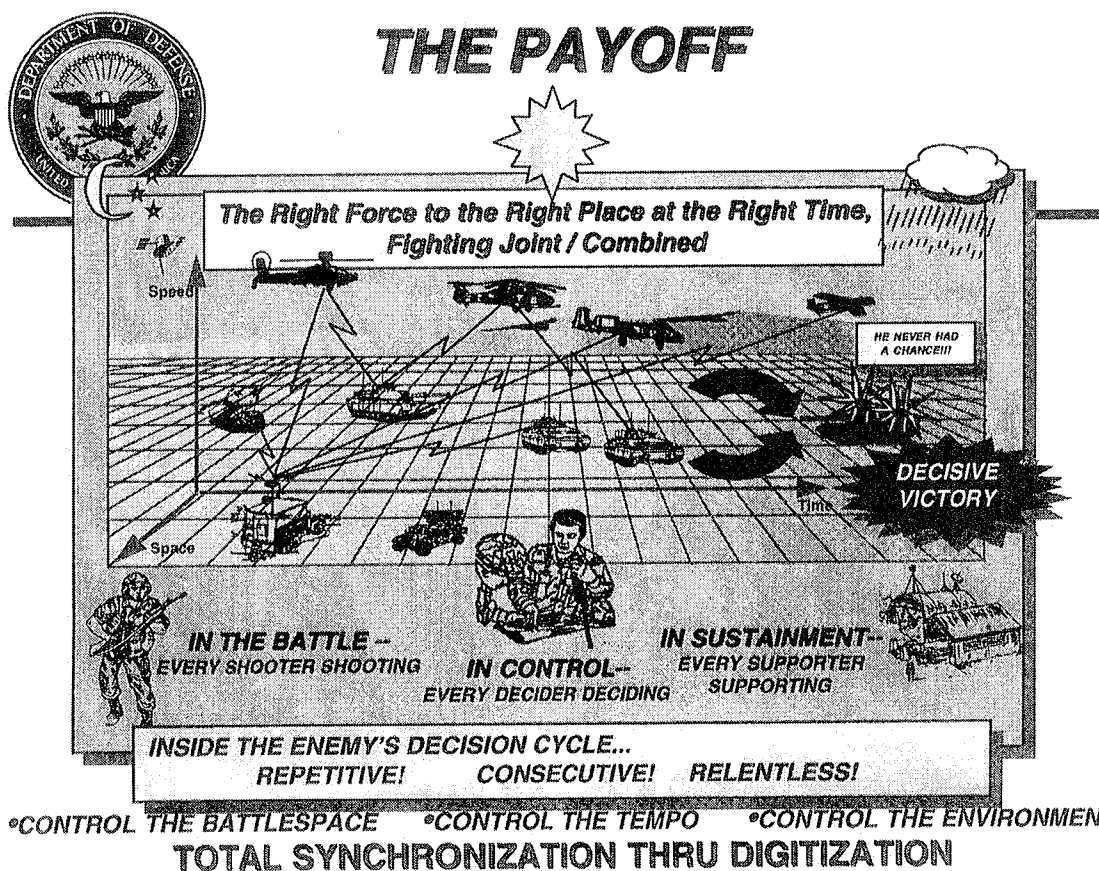MSE: Mobile Subscriber Equip (telephone)
SINCGARS: Tactical Radio
EPLRS: Enhanced Position Location System

FUTURE DIGITAL COMMUNICATION SYSTEM STRAWMAN STRATEGY

FDR: Future Data Radio
NDI: Non-developmental item (off-the -shelf)

KEY IS ASSESSING HOW CANDIDATES FIT INTO OVERALL COMM ARCHITECTURE

ADO CAMPAIGN PLAN

Operational Architecture

Technical Information Architecture

System Architecture

Applique

ACQUISITION
•Log Support
BDE and Below C2 software

•Training
•Integration

Advanced Warfighting Experiments

Experimentation and Evaluation Plan

Feedback

BDE

Interoperability
- Throughout Global Command and Control System (GCCS)

Joint / Combined

DIV   CORPS

Advanced Technology Demos

MSE

SINCGARS

Establish "Tactical Internet"

EPLRS

Integration of all Battlefield Operating Systems

Future Digital Radio Experiments

MSE: Mobile Subscriber Equip (telephone)
SINCGARS: Tactical Radio
EPLRS: Enhanced Position Location System

Scope of the *CALS* Approach to Battlefield Logistics

5

THE PAYOFF

The Right Force to the Right Place at the Right Time, Fighting Joint / Combined

Speed

HE NEVER HAD A CHANCE!!!

DECISIVE VICTORY

Time

Space

IN THE BATTLE --
EVERY SHOOTER SHOOTING

IN CONTROL--
EVERY DECIDER DECIDING

IN SUSTAINMENT-
EVERY SUPPORTER SUPPORTING

INSIDE THE ENEMY'S DECISION CYCLE...
REPETITIVE!   CONSECUTIVE!   RELENTLESS!

•CONTROL THE BATTLESPACE   •CONTROL THE TEMPO   •CONTROL THE ENVIRONMENT
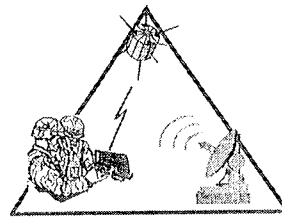
TOTAL SYNCHRONIZATION THRU DIGITIZATION

51

97

Centers of Gravity and Training

- Quality soldiers, sailors, marines, airmen, professional leadership
- Enduring military values
- Ability to harness technology requiring:
  - Intellectual agility
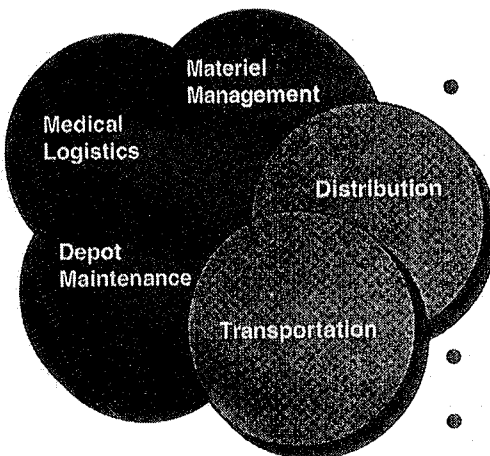 - Defense resourcing
  - Supportive acquisition

Summary

- **Over $2.3B in life cycle savings for deployed systems to date**
  - Over $760M legacy cost avoidance
  - Substantial savings expected in transportation
- **Gross recoveries of $18.2B**
- **Complete integrated test scheduled**
- **Program average ROI**
  - $1 investment = $10.64 return

Materiel Management

Medical Logistics

Distribution

Depot Maintenance

Transportation

DoD Health Affairs and Enterprise Integration

George K. Anderson, Maj Gen, USAF, MC
DASD(HA)
Health Services Operations and Readiness

S15194/37

Health Affairs Mission

◆ Military medicine has two interwoven missions

— To provide, and maintain readiness to provide, medical services during military operations

— To promote and protect the health, well-being, and productivity of members of the armed forces, their family members, and other entitled DoD beneficiaries through the provision of comprehensive health services

Page 2

S15194/37

Medical Readiness

Operational Continuum

MTF

Horizontal Integration
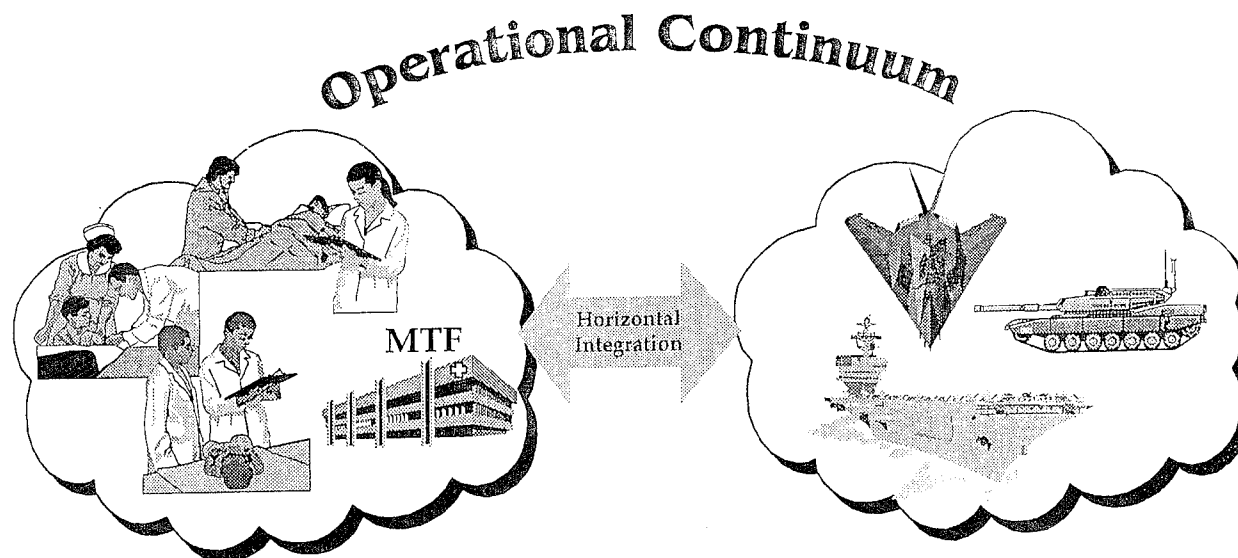
*Focused on integrated information flow
and dual use of technology*

S15194/37

Page 3

MHSS Goals

READINESS

QUALITY

ACCESS

EFFECTIVENESS

COST
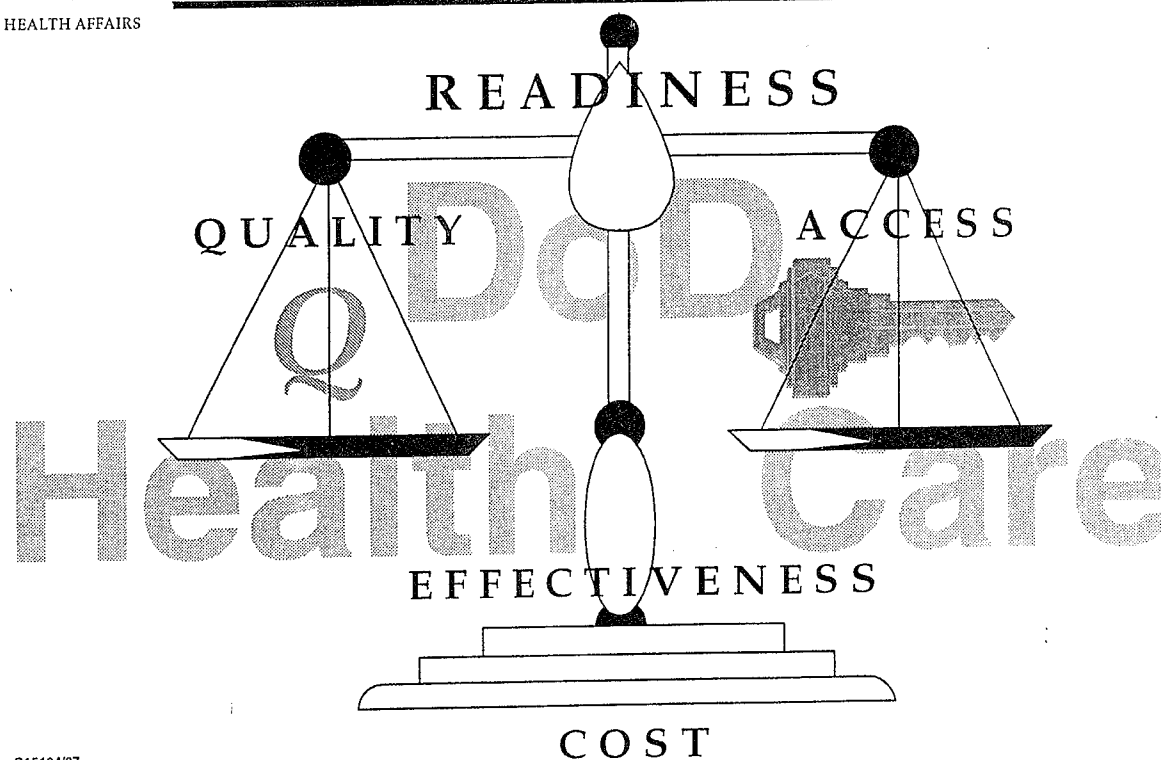
S15194/37

Page 4

Medical Readiness Strategies

◆ Medical Readiness

— Implement the Medical Readiness Strategic Plan (MRSP) 2001

— Minimize the need for training at transition to national security emergencies

— Integrate medical information systems

❖ Facilitate decision making

❖ Ensure that medical capabilities are compatible with Theater requirements

❖ Provide in-transit patient visibility
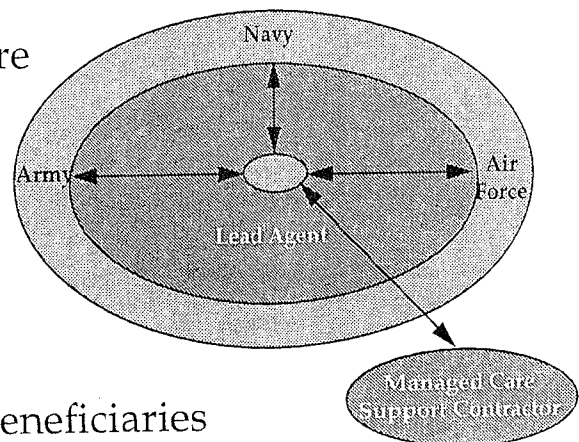
❖ Rapidly project medical supply consumption

Page 5

S15194/37

TRICARE Strategies

◆ TRICARE (Tri-Service Health Care)—a regionalized Managed Health Care program designed to

— Improve access to care

— Improve resources efficiency

— Assure high-quality health care

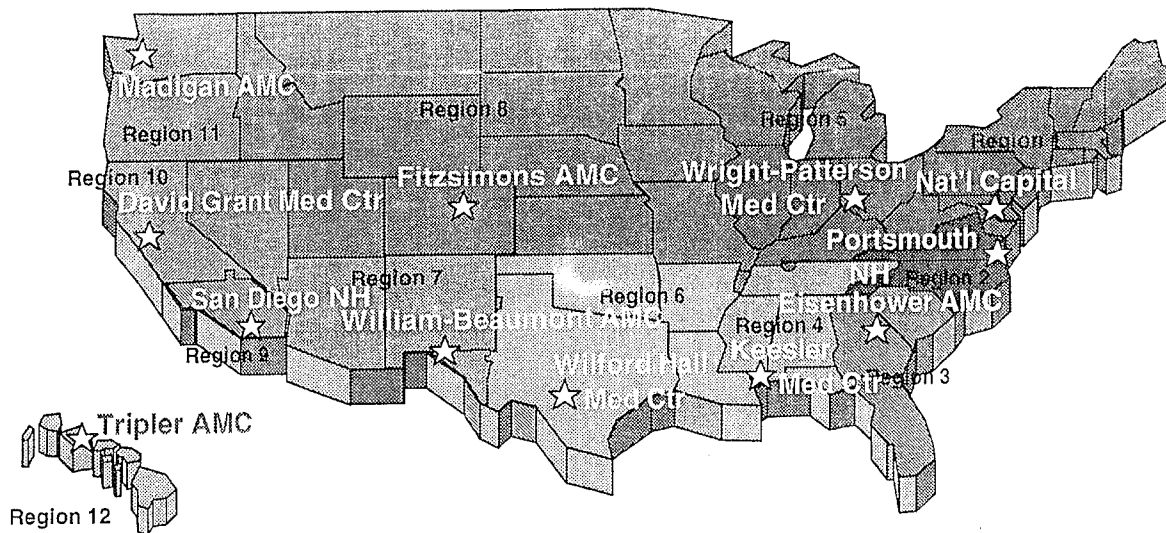— Preserve choice for beneficiaries

— Contain overall cost

Page 6

S15194/37

102

TRICARE Lead Agents and Health Care Service Regions

Madigan AMC
Region 11
Region 8
Region 5
Region 1
Region 10
Fitzsimons AMC
Wright-Patterson Med Ctr
Nat'l Capital
David Grant Med Ctr
Portsmouth NH
Region 2
San Diego NH
Region 7
Region 6
Eisenhower AMC
William-Beaumont AMC
Region 4
Keesler Med Ctr
Region 9
Wilford Hall Med Ctr
Region 3
Tripler AMC
Region 12

Access, Quality, Choice, Cost

S15194/37

Page 7
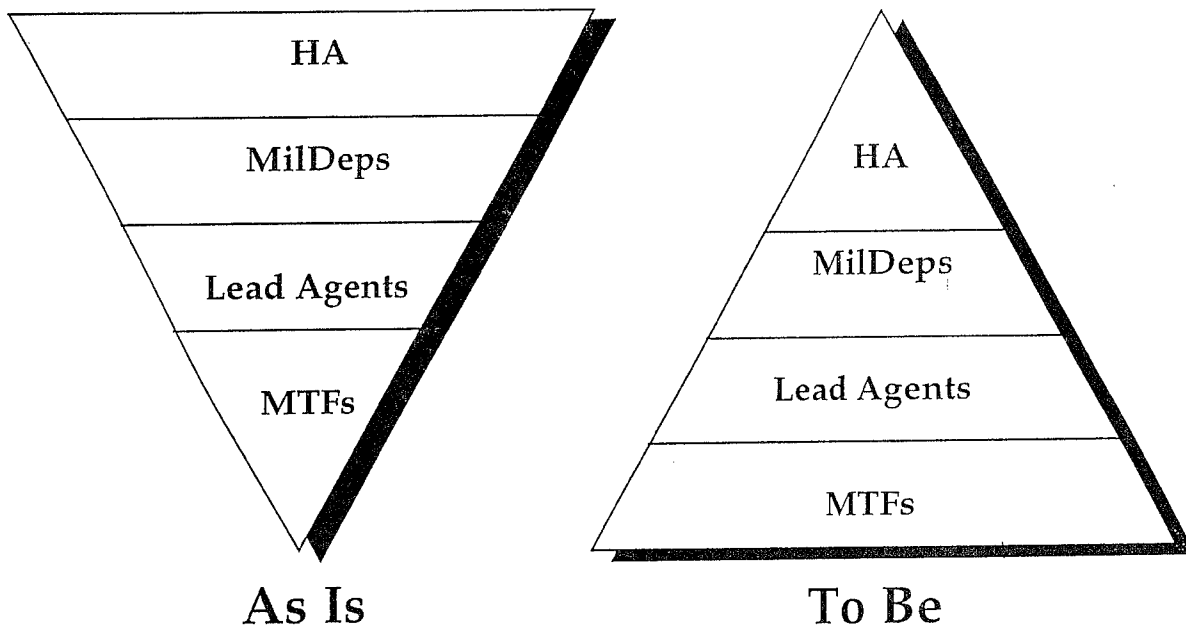
MHSS Data Flow

As Is
- HA
- MilDeps
- Lead Agents
- MTFs

To Be
- HA
- MilDeps
- Lead Agents
- MTFs

S15194/37

Page 8

MHSS AIS Migration

Fewer systems, increased functionality

Total
Legacy
Migration

FY 95   FY 98

Page 10

S15194/37

Defining Information Management Requirements

Health Service Forecast
MTF Managers

Health Service Analysis
MTF Managers   CEIS

Health Service Delivery
Patients and Providers Beneficiaries   CPR
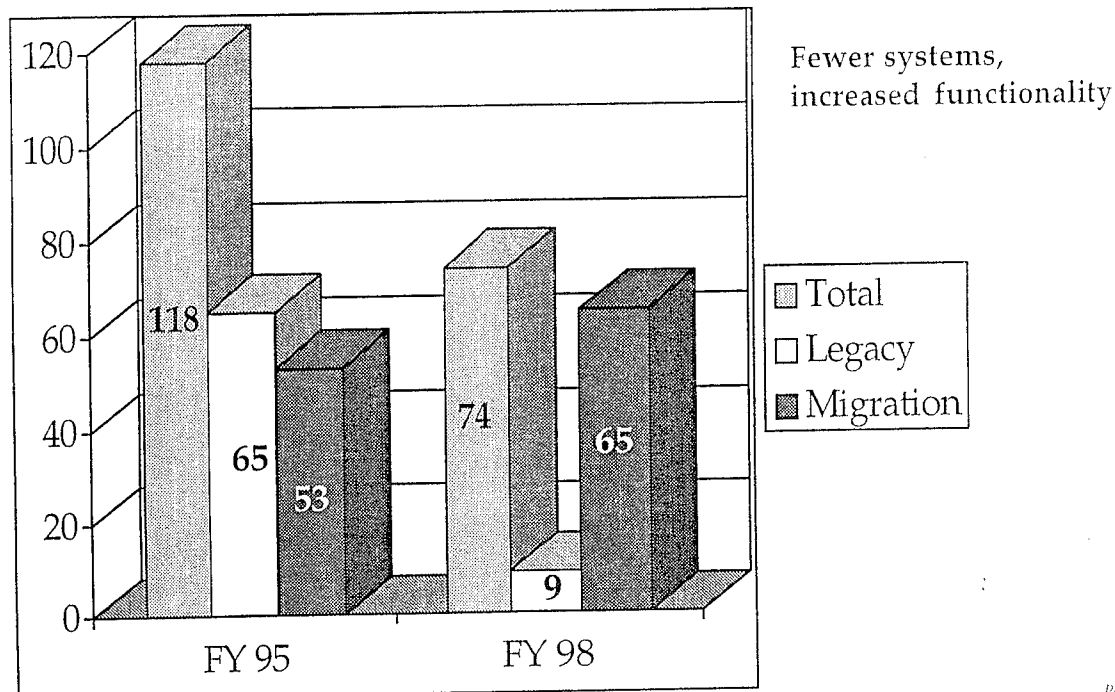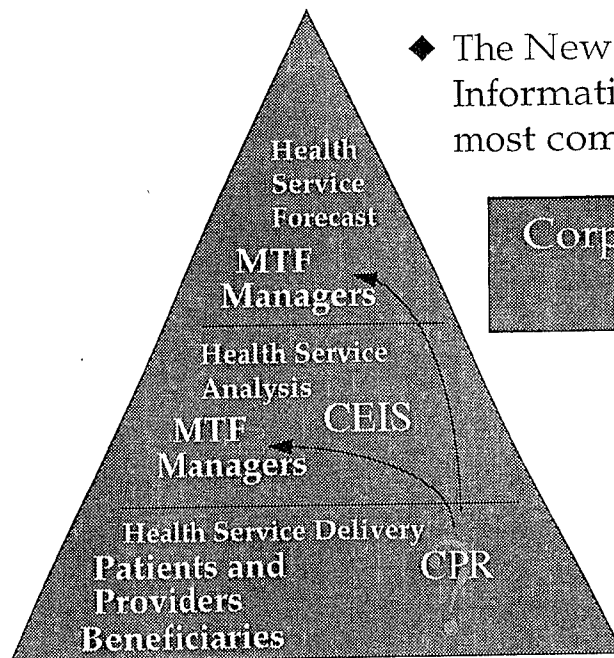
◆ The New Information Architecture: Information for the MTF—first and most complete

Corporate Executive Information Systems

◆ Key to identification and analysis of variations in practice patterns for <u>utilization management</u>
◆ Need machine-readable data
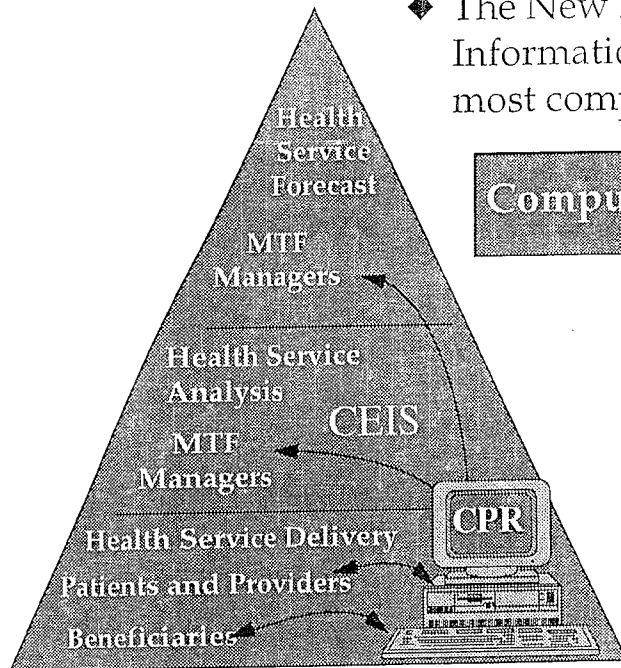◆ Needed by MTF and Lead Agent

Page 9

S15194/37

Defining Information Management Requirements

S15194/37

◆ The New Information Architecture: Information for the MTF—first and most complete

Computer-Based Patient Record (CPR)

A key strategy for competitive advantage
— Patient outreach/education
— Access and health service delivery
— Combat and evacuation care
— Regionalized peacetime care
— Use of practice guidelines
— Utilization management
— Performance measures   *Page 11*

Summary
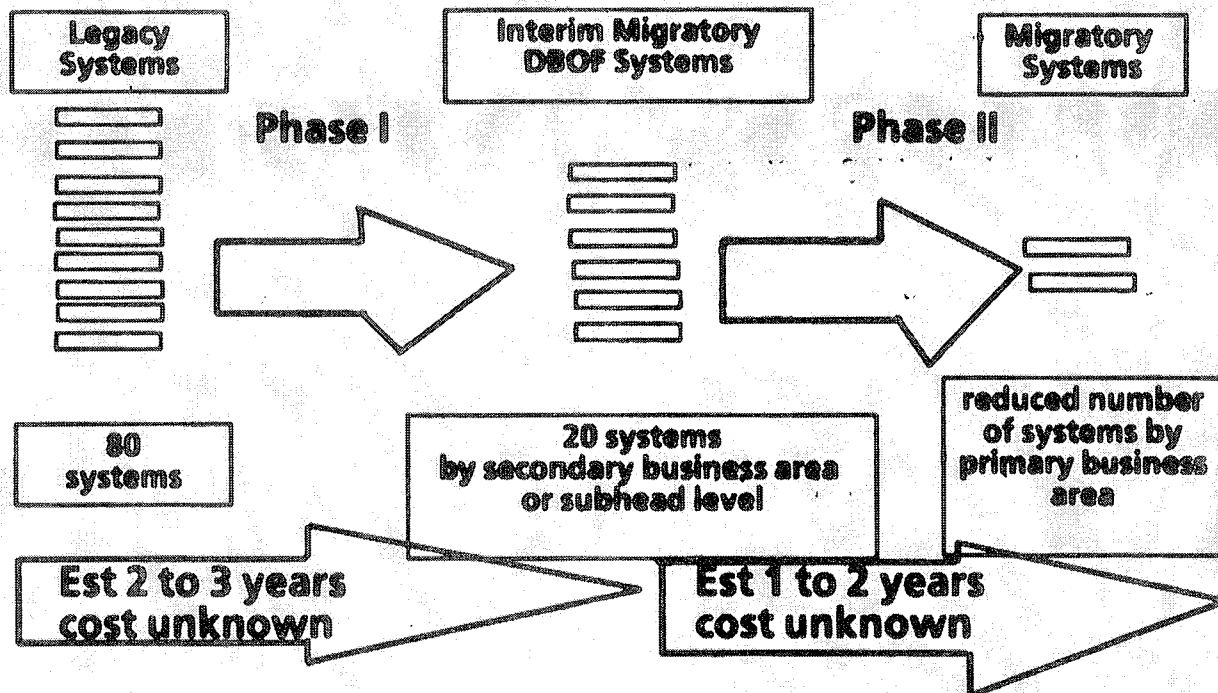
Health Affairs Leads the Way!

S15194/37

Page 12

TRANSITION PLAN FOR FINANCE SYSTEMS

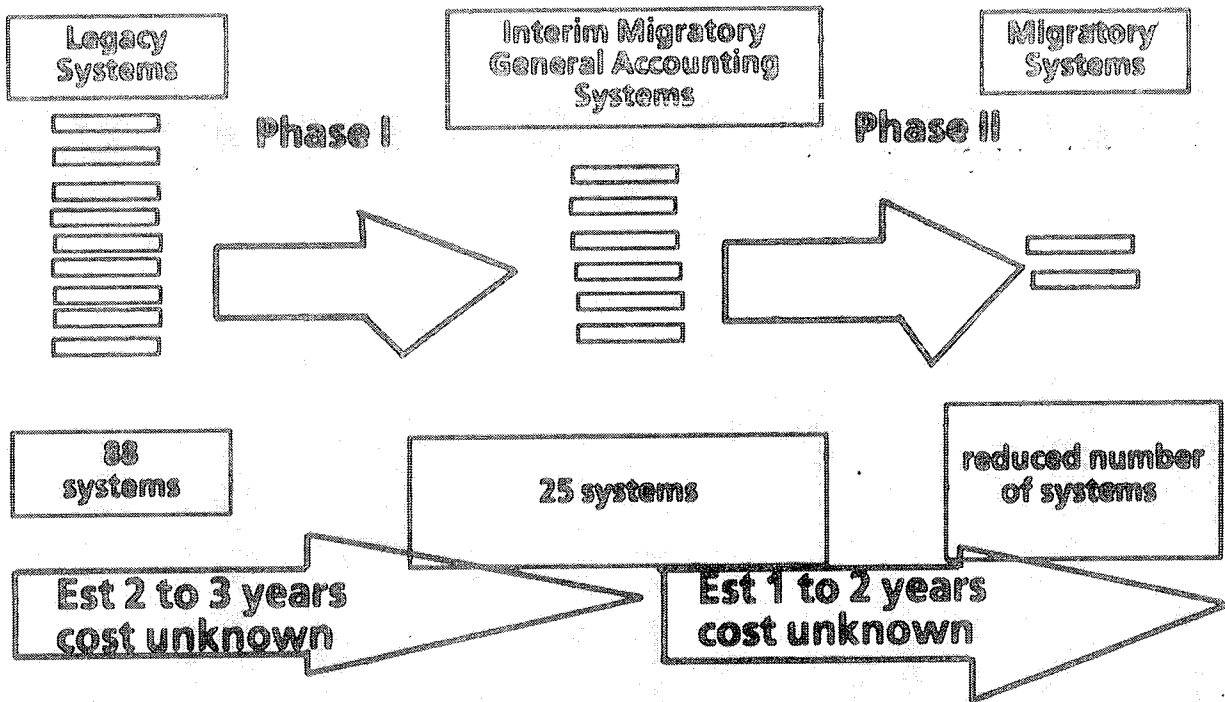|	Number of Applications			
	1991	1994	1995	1996
• Civilian Pay	18	10	8	2
• Military Active and Reserve	18	12	6	2
• Military Retired/Annuitant	8	4	1	1
• Debt Management	5	1	1	1
• Contract Pay	2	2	1	1
• Transportation Payment	3	3	3	1
TOTAL	54	32	20	8

Transition Plan For DBOF Accounting Systems

Legacy Systems

Interim Migratory DBOF Systems

Migratory Systems

Phase I

Phase II

80 systems

20 systems by secondary business area or subhead level

reduced number of systems by primary business area

Est 2 to 3 years cost unknown

Est 1 to 2 years cost unknown
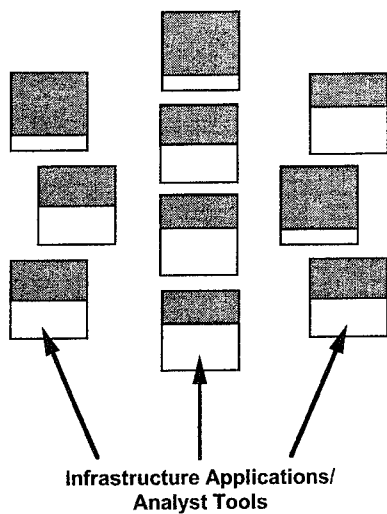
Transition Plan For General Accounting Systems

Intelligence Systems Assessment

ISB Migration Panel

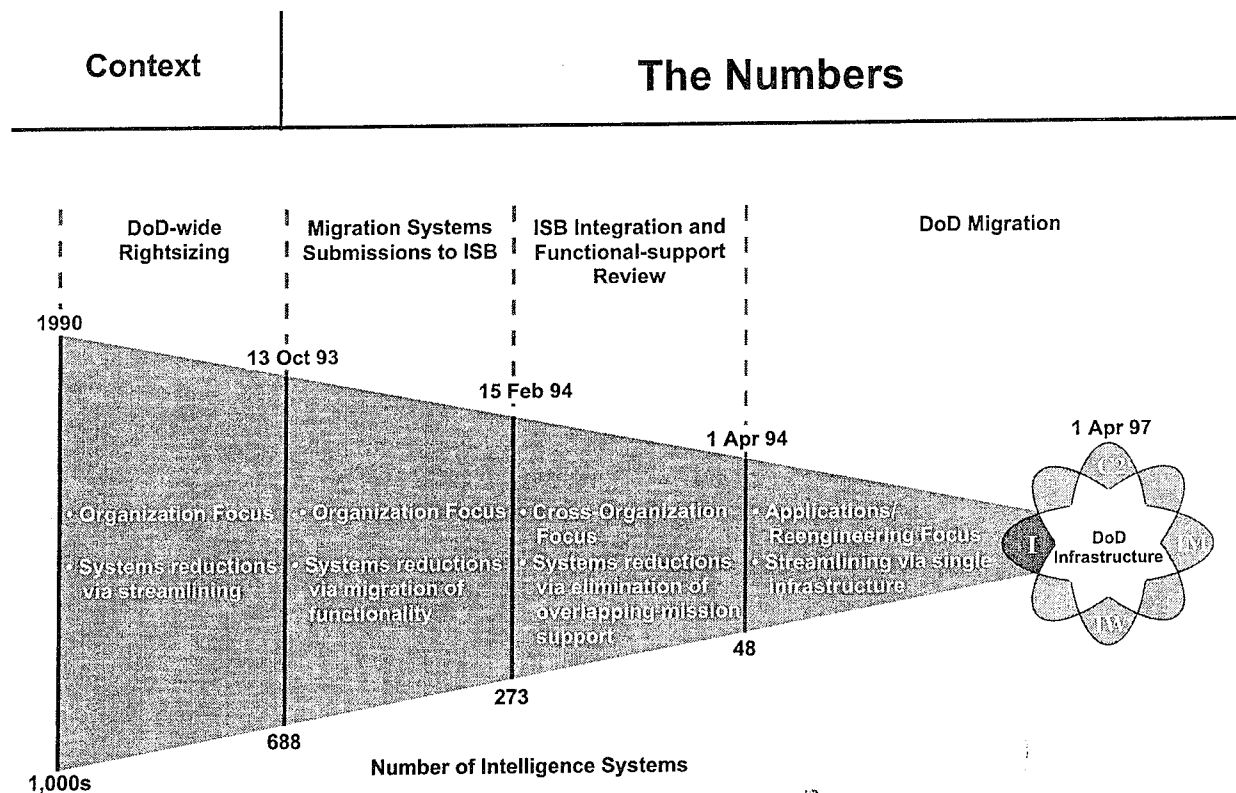| Context	The Target

Nature of Current Migration System Plans

April 1997 Target Environment

Single
Infrastructure

Mission-unique
Applications

Infrastructure Applications/
Analyst Tools

3

Context | The Process

	Phase I Initial Program Selections	Phase II Implementation Strategy and Budget Review	Phase III Systems Migration
Primary Scope	Functional Duplication; Program "line-item" focus (Today's framework)	• Infrastructure and Applications streamlining • Acquisition structure re-vamping	• Single Infrastructure and User Applications • Separation of Infrastruct. and User Appl. Programs
Budget Penetration	Estimates of costs and sources	• Detailed cost profiles and decisions (including re-engineering costs)	• Revised budget structure and allocation (roll-over) discipline
Technical Focus	Functional Support; Infrastructure implications	• Applications • Target Operating Environment definition (including COE/CSE integration) • Data Migration	• Re-engineering (to include applications, infrastruct., data administration impacts)
DoD Impact	Integration of recent DoD-wide "rightsizing" initiatives; Further reductions through cross-examination; Stage-setting for coord. achievement of tgt. objs.	• Common def. of Tgt. Oper. Environ. across C4I • Acquisition structure and budget profiles • Unified program and technical guidance/vehicles	• Single DoD Infrastructure • Applications orientation • Flexibility for re-engr. • Increased capab./access • Cost Aviodance via non-duplication

Oct 93 → Apr 94 → Sep 94 → Sep 97

4

Context | The Numbers

DoD-wide Rightsizing | Migration Systems Submissions to ISB | ISB Integration and Functional-support Review | DoD Migration

1990 — 13 Oct 93 — 15 Feb 94 — 1 Apr 94 — 1 Apr 97

• Organization Focus • Systems reductions via streamlining

• Organization Focus • Systems reductions via migration of functionality

• Cross-Organization Focus • Systems reductions via elimination of overlapping-mission support

• Applications/ Reengineering Focus • Streamlining via single infrastructure

DoD Infrastructure

1,000s
688
273
48

Number of Intelligence Systems

Automated Information System (AIS)

Computer hardware, computer software, telecommunications, information technology, personnel, and other resources which collect, record, process, store, communicate, retrieve, and display information. An AIS may include computer software only, computer hardware only, or a combination of the above. ("Department of Defense Technical Architecture Framework for Information Management," Version 2.0, (Draft), Defense Information Systems Agency. June 22, 1993).

Working Group AIS Categories

- **System of Systems:** An interconnected group of AISs and/or AIS components.

- **System:** A single AIS as defined above.

- **Application:** A specific set of computer software designed to support missions/functions.

- **Infrastructure Component:** A system or application that supports/performs either common operating environment or analyst tool functions.

- **Site Architecture:** A site-specific umbrella ADP concept/environment that includes AISs and/or AIS components. Site Architectures were excluded by the Working Group from further consideration in the systems migration process.

5

6
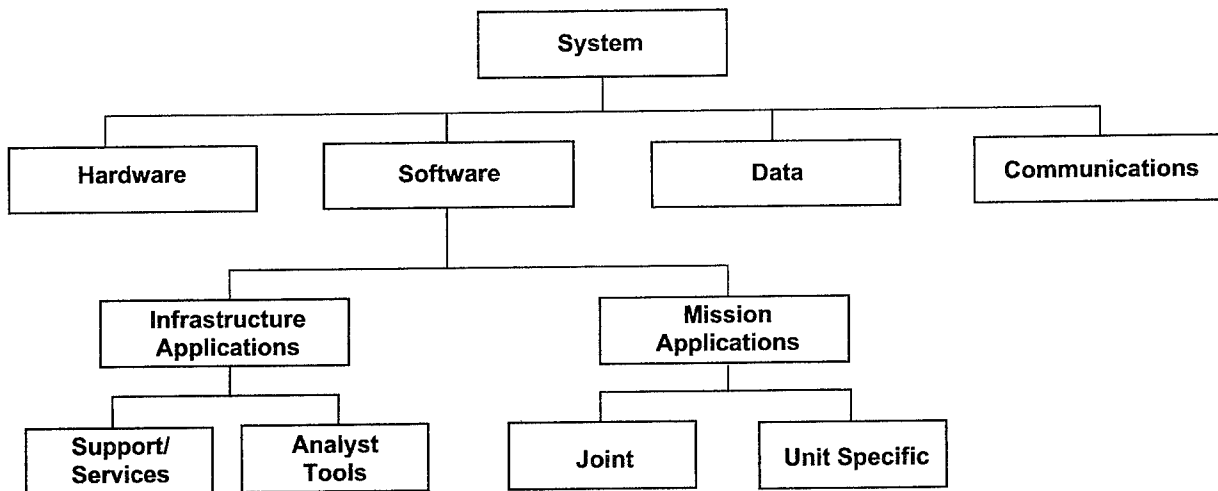
- Migration focus is on AIS, therefore, submissions within the following categories were excluded from further consideration:

  - communications systems (e.g., MUXes, comm. lines, switches)
  - mission-specific collection systems
  - collection-specific processors (except those with significant production focus)
  - special access programs
  - training/simulation systems
  - site-specific tools (minimal funding, in-house developed, COTS)
  - site-specific architectures (e.g., KISS, SOCRATES) are not considered as single entities, however, individual systems within site architectures are considered

- Working Group functional assessment was performed at system level

- Detailed analysis of selected systems at the application/process level is required in order to achieve the following migration goals:

  - development of the target operating environment (infrastructure)
  - identification of joint vs unit-specific mission applications
  - data element standardization within all DoD AISs
  - development of a cost-effective migration strategy

7

Migration Systems Summary
(By Organization: Based on Submission Data Only)

Organization	Number of Systems		
	Candidate	Legacy	Migration
DODIIS (GDIP)	199	170	28
Site-Specific GDIP	****	****	****
DIA (non-GDIP)	7	6	1
Army	9	8	1
Air Force	7	5	2
Navy	3	2	1
USMC	3	1	2
NSA	7	4	3
NRP	6	3	3
CI	***	***	1
CIO	6	5	1
DMA	10	9	1
SOCOM	9	7	2
EUCOM	2	1	1
USACOM	---	---	---
PACOM	---	---	---
CENTCOM	1	1	---
SPACECOM	2	2	---
STRATCOM	1	1	---
SOUTHCOM	---	---	---
TRANSCOM	---	---	---
INCA	1	---	1
Total	273	225	48

*** Legacy attribution for DITDS is accounted for in the DODIIS GDIP submission
**** Command/Site-unique submissions were late in arriving and will be covered in the next phase.

8

Intelligence Submissions Assessment	Migration Systems Summary (by Functional Area)	

Functional Area	Number of Principal Migration Systems
Planning and Direction	2
Collection	5
Processing	1
Production: GMI	5
Production: Scientific and Technical Intel.	11
Production: Targeting	2
Production: MC & G	1
Production: Imagery	6
Production: Relational Display and Analysis	2
Dissemination	1
Support: Message Processing	3
Support: Security	1
All Source Intel./Ops. Interface (I/O)	7
Counterintelligence	1
	48

9

April - September Focus	Implementation Strategy Requirements

- **Establish the Architecture Philosophy for DoD AIS Migration**
  - *Goals:* Distributed, client-server computing environment, single infrastructure, consistent data schema, etc.

  - *Principles/Assumptions:* COTS vs. GOTS, bundling of functionality, standardized vs. user-tailored H/W, S/W configurations, etc.

  - *Governing Standards:* DoD TAFIM, DODIIS Profile, etc.

- **Define the Target Computing Environment (Infrastructure)**
  - Services/support applications
  - Common-user tools

- **Specify Technical Guidance for Applications development (APIs, conventions (directory structures, naming conventions), etc.)**

- **Specify core set of DoD standard data elements (with required extensions)**
  - include all functional areas
  - load into DDRS

- **Define/recommend Acquisition Structure/Policy**

17

114

Next Steps

- Resolve issues remaining from first phase

- Perform Applications-level review of migration systems
  in Key Infrastructure and Mission-specific Functional Areas
  (April - June 94)

- Conduct detailed examination of current infrastructure initiatives
  (April - August 94)

  - GCCS Common Operating Environment (COE)
  - DODIIS Client-Server Environment (CSE)

- Obtain data element approvals for all functional areas; load into
  DDRS (use IDEAS upgrade as starting point)

- Establish a program to coalesce and combine intelligence
  broadcast/receive systems (April - September 94)

- Develop the template for determining the "cost
  avoidance" associated with systems migration (April -
  September 94)

18

ISB Intelligence
Systems Migration
Strategy

Technical Guidance (Some Key Issues)

Migration Objectives

- How do we re-structure current
  programs and capabilities?

- What is the construct, composition,
  and scope of the client-server
  framework?

- What acquisition issues (policy,
  funding, ...) impact goal achievement?

COE/Infrastructure

- What is "the COE"?

- What is the "infrastructure"
  application breakout (infrastructure-
  vs user-domain)?

- How do we reconcile the intelligence
  COE with the GCCS "middleware"
  concept?

Standards Profile

- How do we reconcile and collapse DISA TAFIM,
  DODIIS, NSA, CIO, and other profiles into a
  single, affordable, and achievable target profile?

- How do we address standards gaps not
  resolvable in the migration timeframe?

Design Guidance

- How do we achieve configuration control of interfaces
  to the infrastructure and information?

- What security posture/rules should form the basis
  for target implementation? Policy changes?

Transition Considerations

- What capability levels should we ensure are achieved
  across all programs as a function of time?

- What latitude should we allow for work-arounds,
  gateways, etc., where affordability issues may
  preclude full implementation of guidance?

Participants

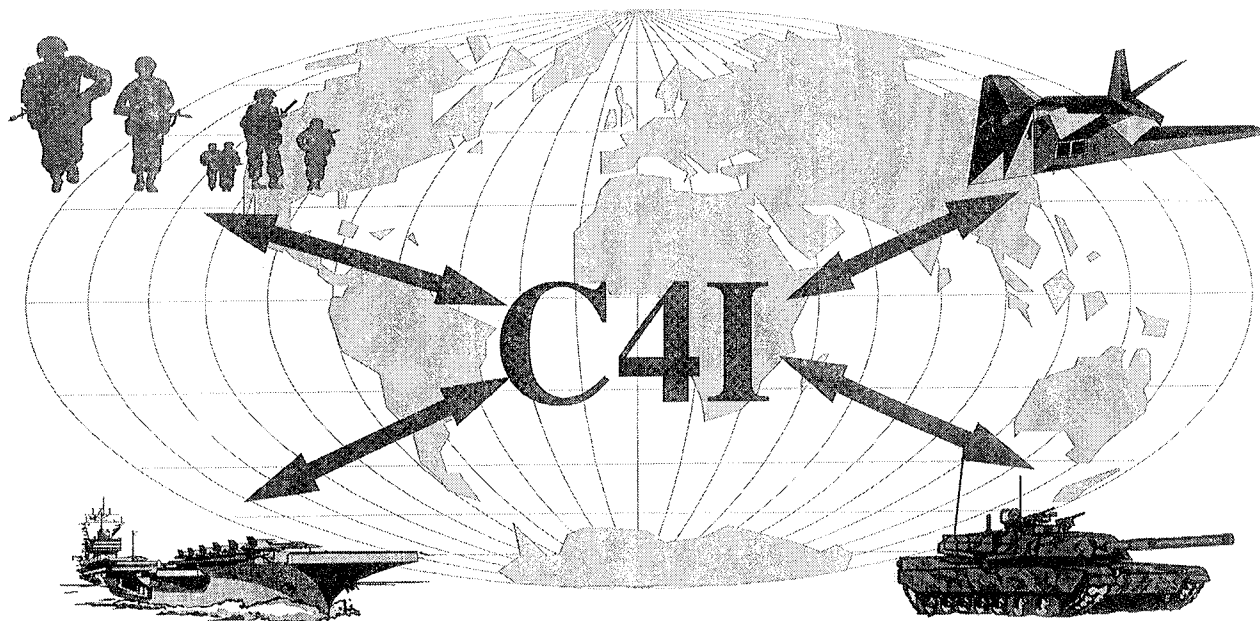|	
JS/J6	**RADM Charles R. Saffell, Jr.**
USA	**MG Edward R. Baldwin, Jr.**
USN	**CAPT David Smania**
USMC	**Mr. Ronald D. Elliott**
USAF	**COL Joseph M. Narsavage**

C4I for the Warrior

Four Services--One Team, One Fight

C4I--the tie that binds

117

INFORMATION is the lifeblood of modern war just as fuel was the lifeblood in the North African desert and munitions and gunpowder were the lifeblood in WWI.
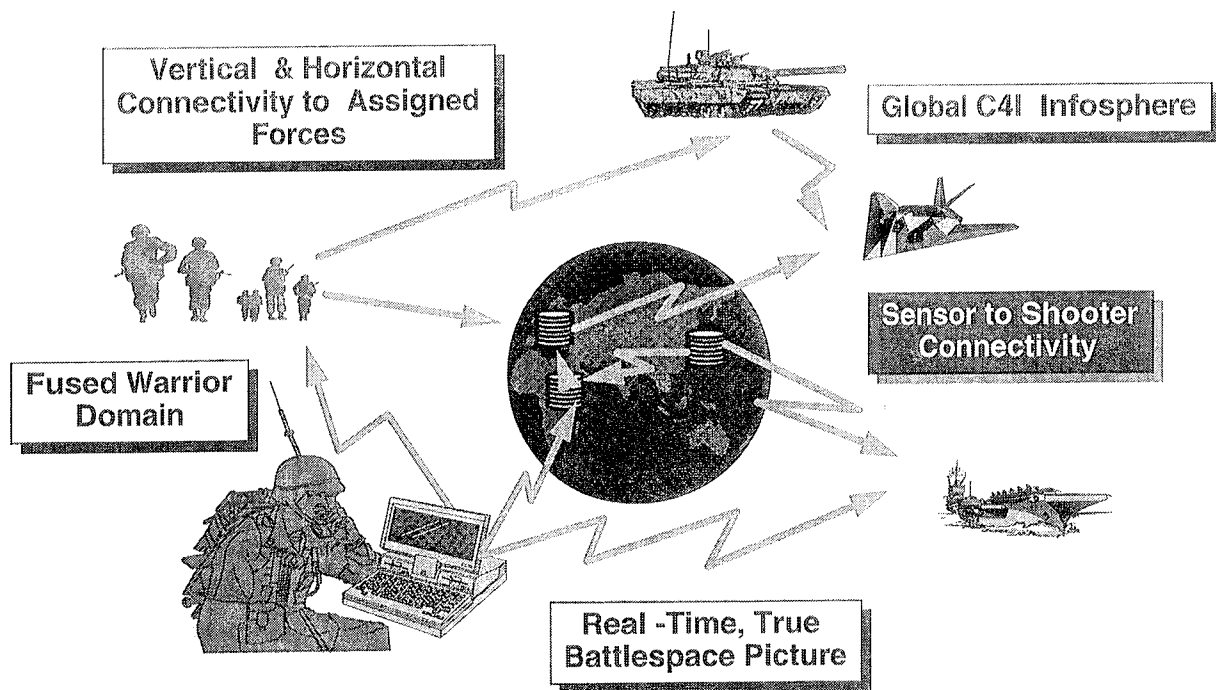
INNOVATIVE USE
OF MODERN TECHNOLOGIES =
NEW POSSIBILITIES
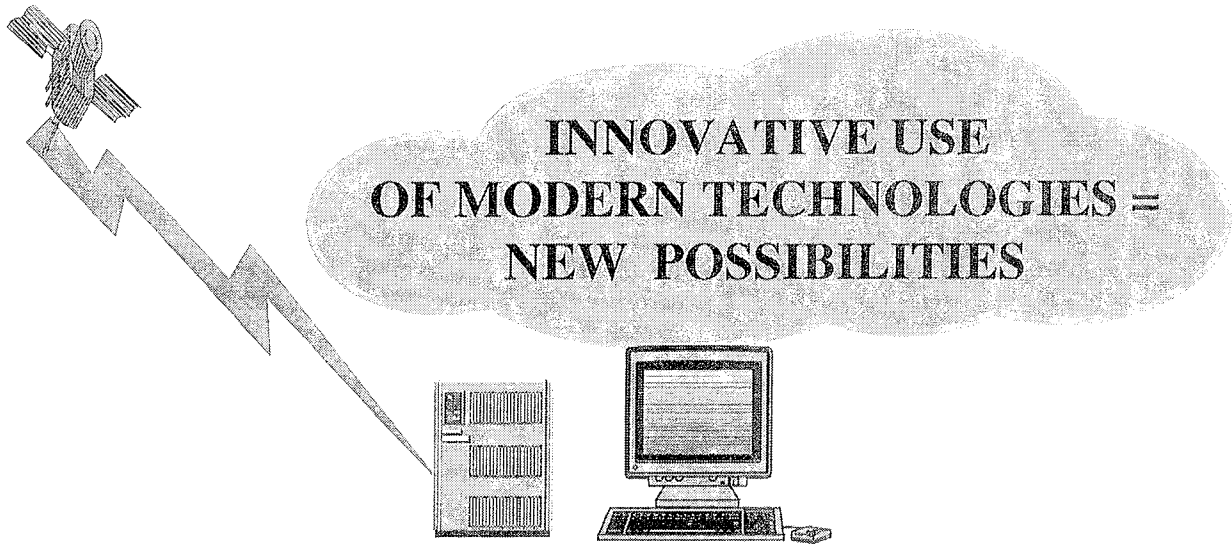
Vision

The Warrior needs a fused, real-time, true picture of the battlespace and the ability to order, respond, and coordinate vertically and horizontally to the degree necessary to prosecute the mission in that battlespace.

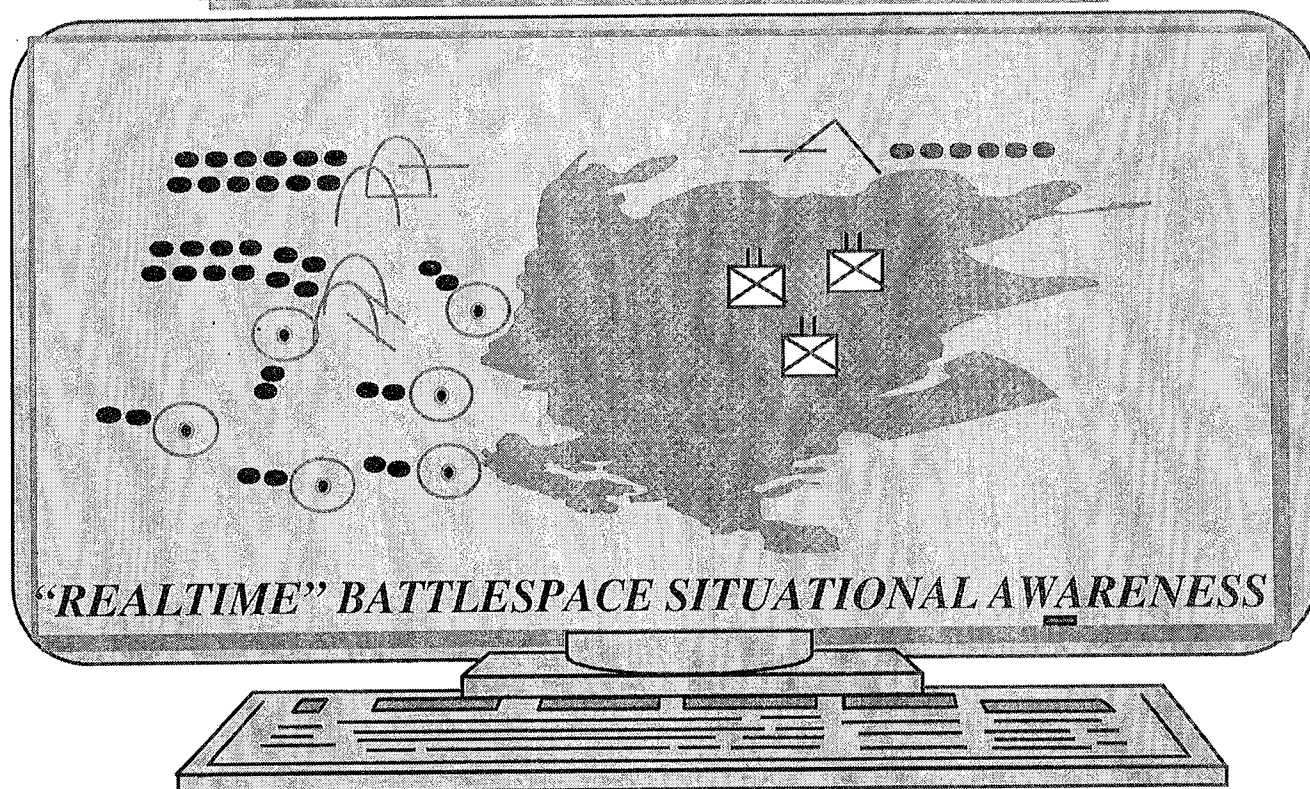Vertical & Horizontal Connectivity to Assigned Forces

Global C4I Infosphere

Sensor to Shooter Connectivity

Fused Warrior Domain

Real-Time, True Battlespace Picture

COMMON TACTICAL PICTURE
WHAT IS HAPPENING "NOW"

"REALTIME" BATTLESPACE SITUATIONAL AWARENESS

BATTLESPACE MANAGEMENT
WHAT IS GOING TO HAPPEN

IMPLICATIONS
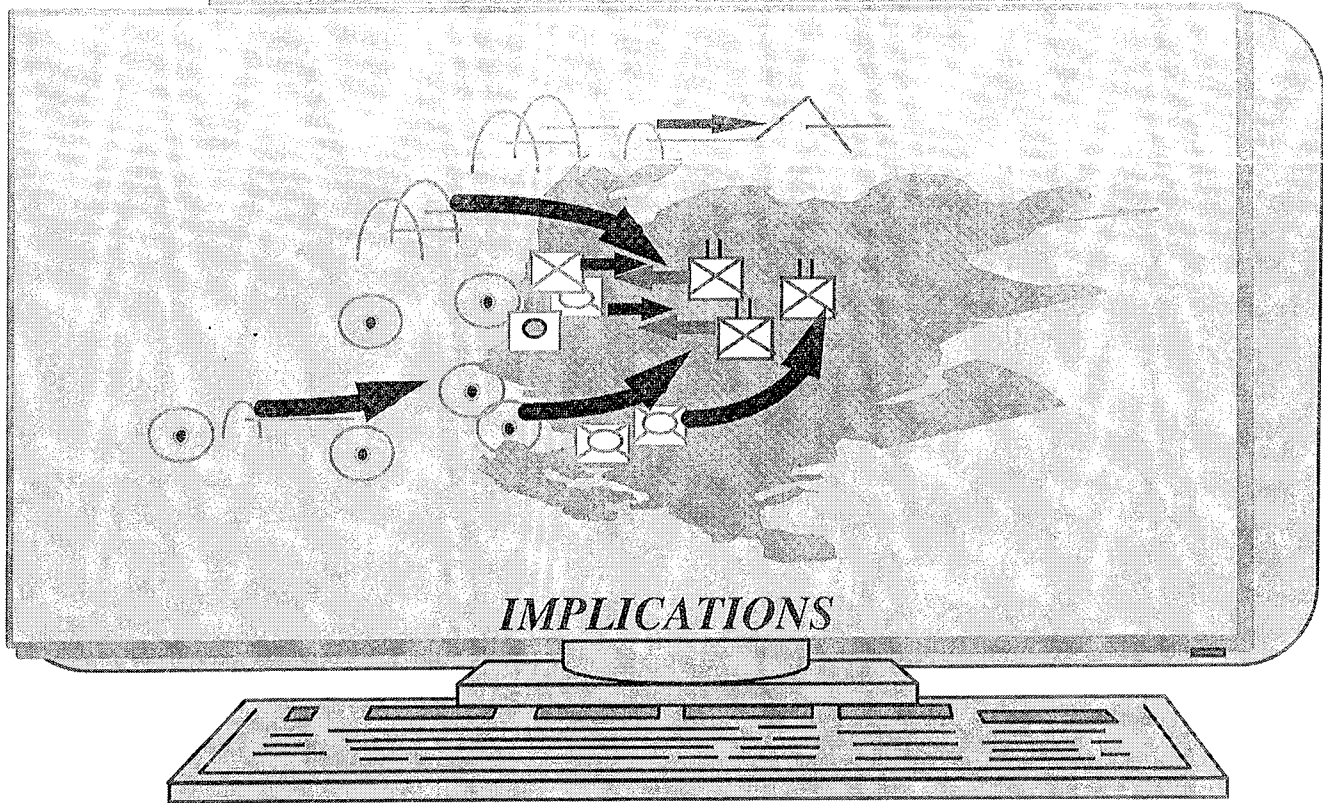
GCCS: The Bridge to the C4I for the Warrior Objective

OBJECTIVE
Fused Warrior Domain
- Real time, true battlespace picture
- Vertical and horizontal connectivity to assigned and coalition forces
- Global infosphere

MID-TERM
- C2 Migration/Rightsizing
- Global Command and Control System Initial Operational Capability

QUICK FIX
Standards and translators
- DOD Interoperability Policy
- Center for Standards
- Joint Universal Data Interpreter (JUDI)
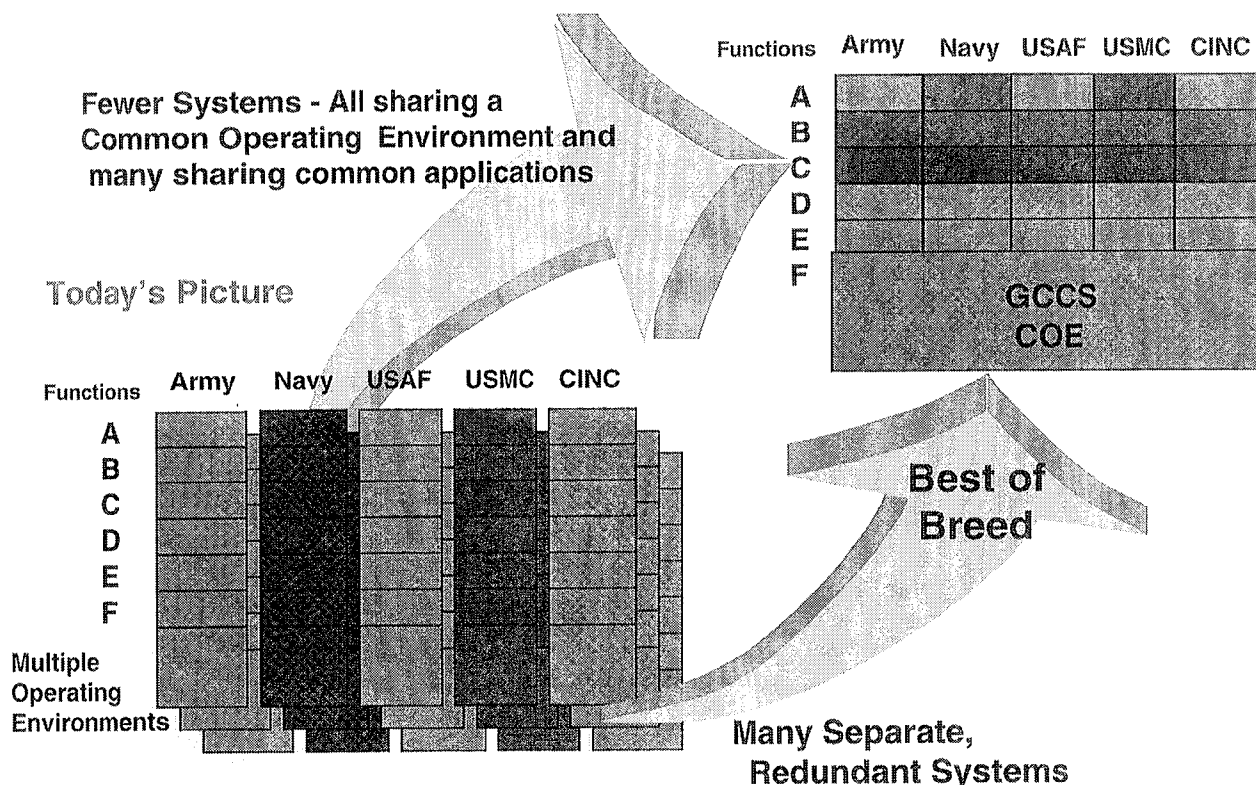
Migration/Rightsizing
OSD Mandate

In keeping with the Deputy Secretary of Defense memorandum of October 13, 1993, "accelerated Implementation of Migration Systems, Data Standards, and Process Improvement," the principal migration path for worldwide command and control within DoD will be the Global Command and Control System.

GCCS will be developed under the umbrella of the C4I for the Warrior concept providing the warfighter flexible and interoperable worldwide command and control.

Mr Paige
27 Dec 93

Functionality Migrates to GCCS

GCCS Vision

Fewer Systems - All sharing a Common Operating Environment and many sharing common applications

Functions	Army	Navy	USAF	USMC	CINC
A					
B					
C					
D					
E					
F		GCCS COE			

Today's Picture

Best of Breed

Functions	Army	Navy	USAF	USMC	CINC
A					
B					
C					
D					
E					
F					

Multiple Operating Environments

Many Separate, Redundant Systems

Common Functionality Based on Migration and Integration

GCCS provides a core of functionality that....

"Uniques"

Army

CINCs

Time

GCCS

Time

Navy

USMC

Air Force
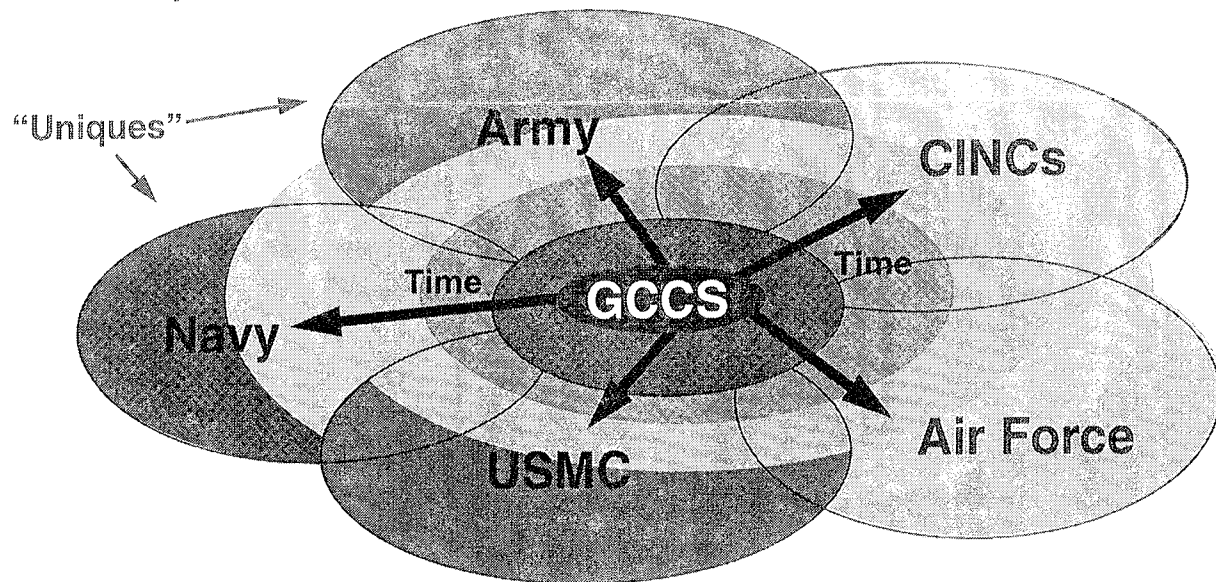
... establishes a common C2 standard.

C4I for the Warrior Objective:
Fused Warrior Domain

100% Interoperable
Global in Scale

Anywhere
Anytime
Any Mission
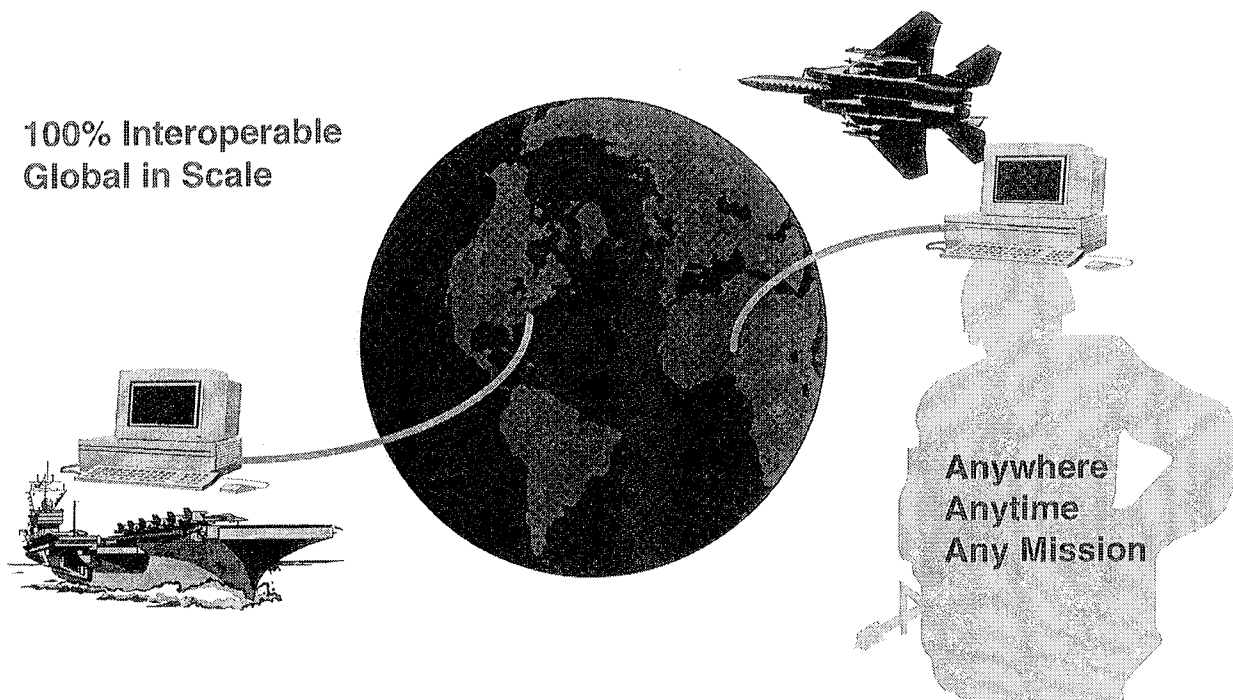
"I will support only one [Joint] Command and Control System."
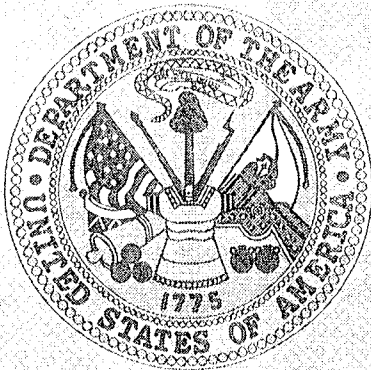
General Shalikashvili
Chairman, JCS

Army Command and Control

MG Edward R. Baldwin, Jr.

Vice Director of Information Systems for
Command, Control, Communications, and Computers

Department of the Army

Army Command and Control Efforts

- Based on Joint Doctrine
- Force XXI is "umbrella effort"
    - Coordinated Initiatives
    - Key is Digitized Battlefield
    - Hypothesis for Experimentation
- Army Enterprise - Need for Clear Architecture
    - Three Architectures
    - Top Level Direction/Support
    - Technical Architecture Components
- Army C4I Systems Architecture
- Army Committment to JCOE

FORCE XXI DEFINED

- We have begun to move into third-wave warfare, to evolve a new force for a new century..... *Force XXI.*

- *Force XXI* will synthesize the science of computer technology, the art of integrating doctrine and organization, and the optimization of our quality people. The goal is to create new formations that operate at even greater performance levels in speed, space, and time.

CSA INTENT

" I KNOW WHERE YOU ARE...

I KNOW WHERE YOU AREN'T...

I'M COMING AFTER YOU ...

DAY OR NIGHT!!!"

- GEN Gordon R. Sullivan

What Joint Doctrine Says About Operations

- Joint Force Operations should be conducted across the full breath and depth of the operational area, creating competing and simultaneous demands on enemy commanders and resources.

- Areas of Operations must be sufficiently large to allow land and naval commanders to protect their forces, and fight at extended ranges.

- Areas of Operations for land and naval commanders are based on the mission and size of the force being employed. Land and naval commanders are SUPPORTED COMMANDERS within their Areas.

Reference: Joint Pub 3-0, *Doctrine for Joint Operations*, September 1993.

DIGITIZATION

Digitizing the Battlefield is the application of information technologies to acquire, exchange, and employ timely digital information throughout the battlespace, tailored to the needs of each decider (commander), shooter, and supporter...allowing each to maintain a clear and accurate vision of his battlespace necessary to support both planning and execution.
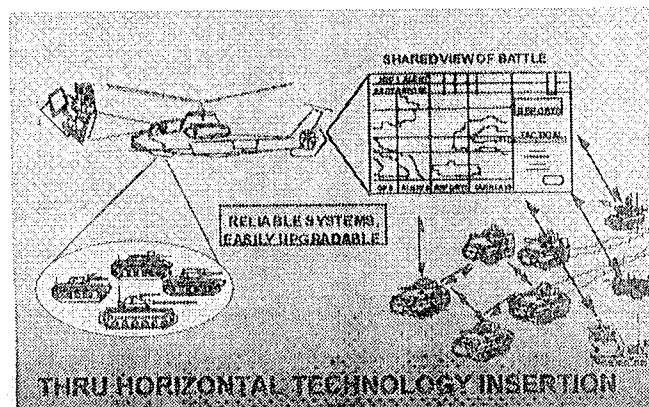
FROM STRATEGIC ASSETS TO THE TACTICAL LEVEL

WITHIN THE ARMY AND WITHIN JOINT / COMBINED OPERATIONS

The Fundamental Hypothesis

IF we know the performance of a baseline organization....

Then we can apply Information Age Technology to that organization, conduct experiments, and gain insights into improved battlefield performance...

Which **will cause us** to redesign operational concepts and units to optimize military capabilities.

Currently Equipped Units

New Units:
- Digitized
- Redesigned

"THREE AXES"

Three Axes
- **Simultaneous, interactive process**
- **LAM will synchronize**
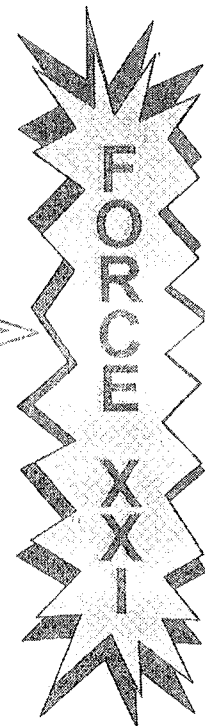
TDA/Institutional

Big "A" Army
- TDA
- Title 10

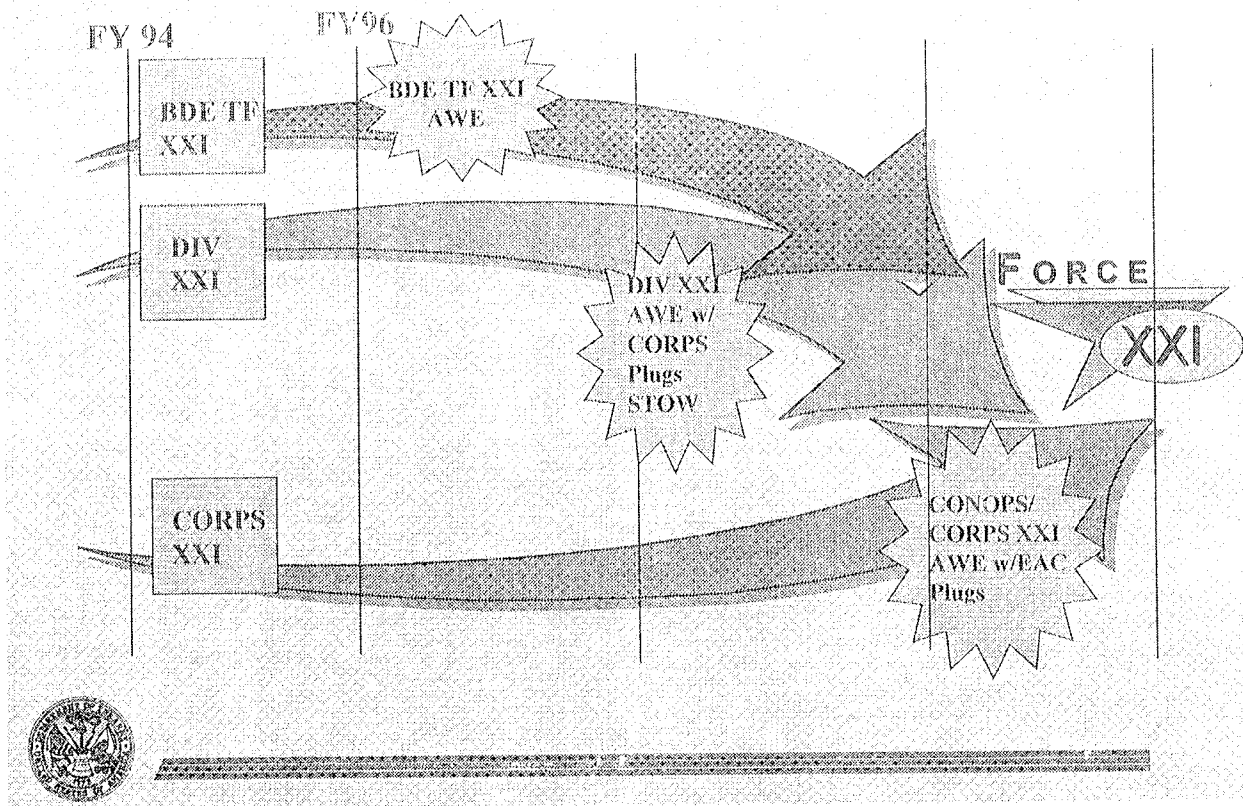Operating Army

Acquisition Reform must succeed
- **Statutory**
- **Regulatory**
- **Policy**

Army Digitization Office

Information Technology Assimilation Programmatics

FORCE XXI

JOINT VENTURE CAMPAIGN

FY 94   FY 96

BDE TF XXI

BDE TF XXI AWE

DIV XXI

DIV XXI AWE w/ CORPS Plugs STOW

CORPS XXI

CONOPS/ CORPS XXI AWE w/EAC Plugs

FORCE

XXI

Army Enterprise Strategy: The Vision
Focus on the Warfighter

The Needs:
- *Information to support the joint warfighter*
- *Information to achieve victory*
- *Information any time any place*

The JCS Vision:

C^4I
For the Warrior

The Army Vision:

Force XXI

Task Force XXI

Enterprise Strategy
- *Provides C4I Vision for Force XXI*
- *Implementation Plan manages process*
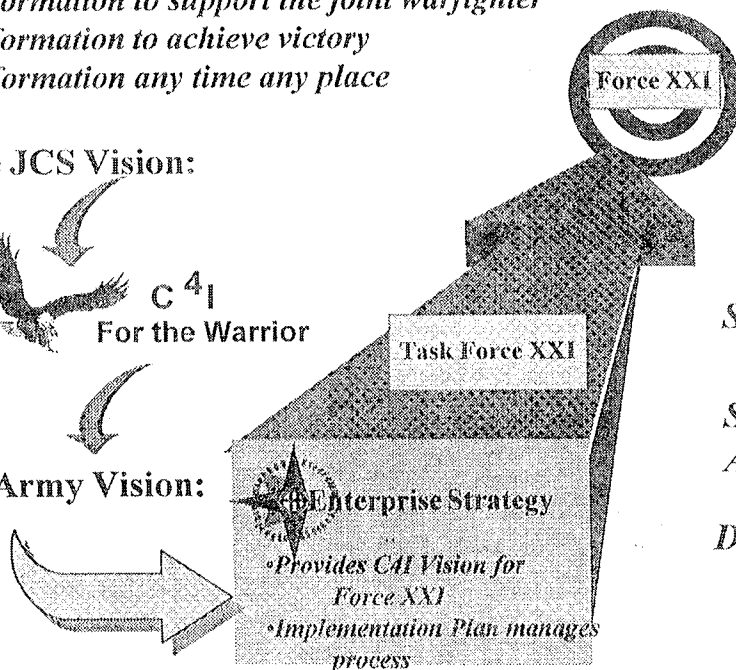
"Winning the Information War"

Situational Awareness

Seamless Information Architecture

Digitize the Battlefield

- **Operational Architecture.** A description, (often graphical), defining:

– the required connectivity of force elements – OPFAC to OPFAC, OPFAC to weapon platform, inter-weapon platform;

– types of traffic to be passed over each path, documented in user interface requirements.

This defines processes and the information required to accomplish a function. It specifies what the information system must do and where it must do it.

ASB Architecture Definitions

- **Technical Architecture.** A minimum set of rules governing the arrangement, interaction, and interdependence of the parts or elements that together may be used to form an information system, and whose purpose is to ensure that a conformant system satisfies a specified set of requirements.

- Systems Architecture. A description, (often graphical), of the physical connectivity of an information system which may include:
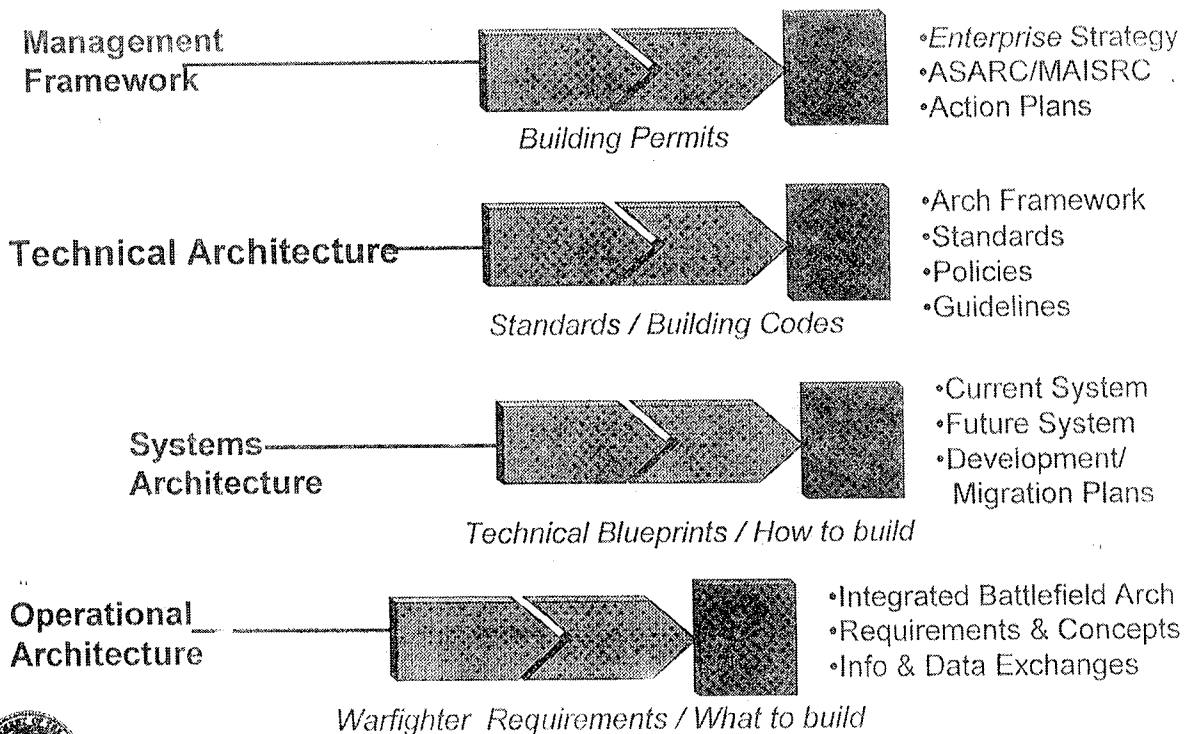
— the identification of all nodes, radio, switches, terminals, and their physical deployment;

— specification of bandwidth required on each circuit.

This is a description of which parts will be linked together by which means. It shows the components capabilities.

Army Information Architectures

Applies to all soldier, weapon and information systems

Management Framework
Building Permits
- *Enterprise* Strategy
- ASARC/MAISRC
- Action Plans

Technical Architecture
Standards / Building Codes
- Arch Framework
- Standards
- Policies
- Guidelines

Systems Architecture
Technical Blueprints / How to build
- Current System
- Future System
- Development/ Migration Plans

Operational Architecture
Warfighter Requirements / What to build
- Integrated Battlefield Arch
- Requirements & Concepts
- Info & Data Exchanges

ARMY C4I SYSTEMS ARCHITECTURE

XXXX

XXX

XX

X

II

GCCS

AWIS | ASAS-EAC

AGCCS

STACCS | CSSCS-EAC

JCOE

ABCS

ATCCS

MCS | FAADC3I | MCS | FAADC3I

CSSCS | AFATDS | CSSCS | AFATDS

ASAS | ASAS

FBCB2

Sustaining Base

- DoD TECHNICAL ARCHITECTURE FOR INFORMATION MANAGEMENT

- OPEN SYSTEM ENVIRONMENT

- COMMERCIAL STANDARDS & PROTOCOLS

STAMIS

ACOE

Tactical Forces

The Joint Common Operating Environment is Key

Migration Selection to get mission application to the minimum esstential number

MISSION APPLICATIONS

SUPPORT APPLICATIONS

PLATFORM SERVICES

PLATFORM

COE

ACOE migration to: **JCOE**
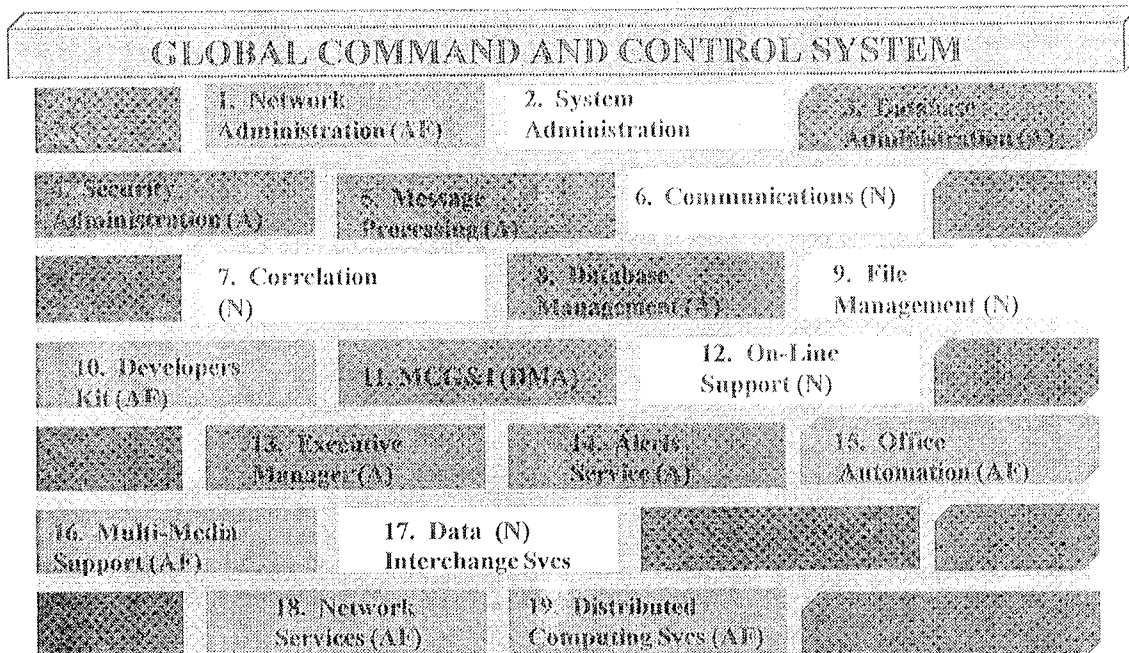
- AGCCS - implementing JCOE as it develops
- All others - transition plans to be developed

131

INITIAL GCCS BASELINE FUNCTIONS

GLOBAL COMMAND AND CONTROL SYSTEM

1. Network Administration (AF)	2. System Administration	3. Database Administration (N)
4. Security Administration (A)	5. Message Processing (N)	6. Communications (N)
7. Correlation (N)	8. Database Management (A)	9. File Management (N)
10. Developers Kit (AF)	11. MCG&I (DMA)	12. On-Line Support (N)
13. Executive Manager (A)	14. Alerts Service (A)	15. Office Automation (AF)
16. Multi-Media Support (AF)	17. Data (N) Interchange Svcs	
18. Network Services (AF)	19. Distributed Computing Svcs (AF)	

▓▓ Army   ☐ Navy   ▒▒ Air Force   ▓▓ DMA

Army Command and Control Efforts

- **Based on Joint Doctrine**

- **Force XXI is "umbrella effort"**
  - Coordinated Initiatives
  - Key is Digitized Battlefield
  - Hypothesis for Experimentation

- **Army Enterprise - Need for Clear Architecture**
  - Three Architectures
  - Top Level Direction/Support
  - Technical Architecture Components

- **Army C4I Systems Architecture**

- **Army Committment to JCOE**

Navy C4I
The Vision and the Strategies
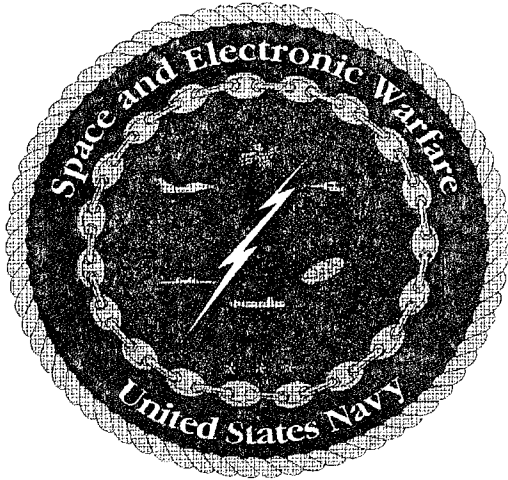
Captain David Smania

Director, Information Resource Management Division (N65)

Chief of Naval Operations
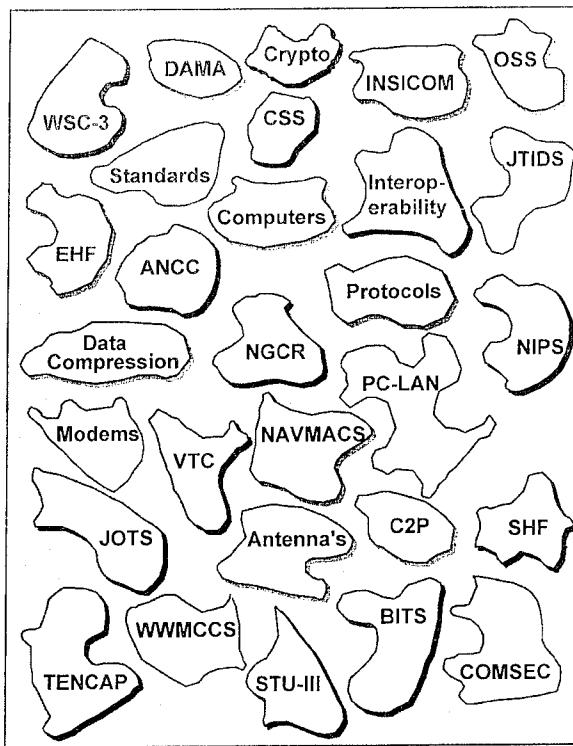

COPERNICUS

THE BEGINNING

THE COPERNICUS ARCHITECTURE
### A C4I PARADIGM SHIFT

What is Copernicus?

- A *user-centered* approach to information management

- A Command and Control *information management* and *information technology* architecture

- An architecture married to an *investment strategy*

- A *blueprint* for capturing technological change

- Copernicus is <u>NOT</u> a program in the formal acquisition sense, it is the goal architecture and unifying strategy for all C4I programs

"Puzzle Pieces"   "Composite Picture"
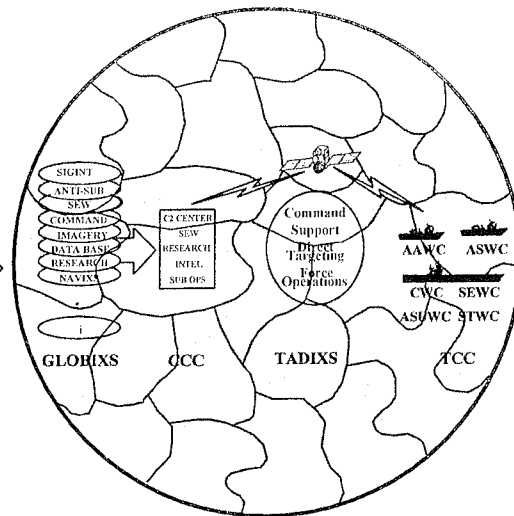
Copernicus is the Goal Architecture for C4I Programs

5 "ESSENTIAL ELEMENTS" OF COPERNICUS

1. Tactical Information (C4I) vs. Non-Tactical
2. "User Pull," "Intelligent Producer Push"
3. Multimedia (Voice / Data / Video)
4. Common Building Blocks = Standardization
5. Common Operating Environment = Interoperability
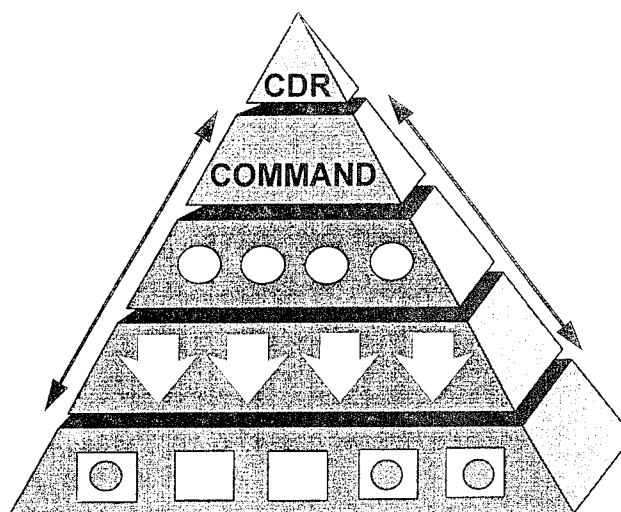
OLD PARADIGM

THE COHERENT JOINT CONSTRUCT

CDR

COMMAND
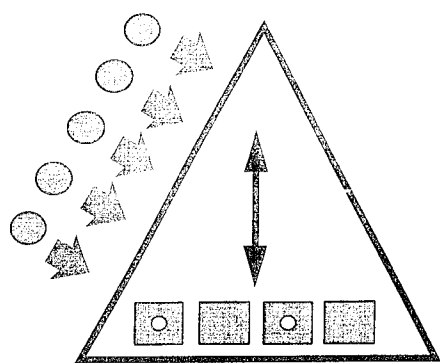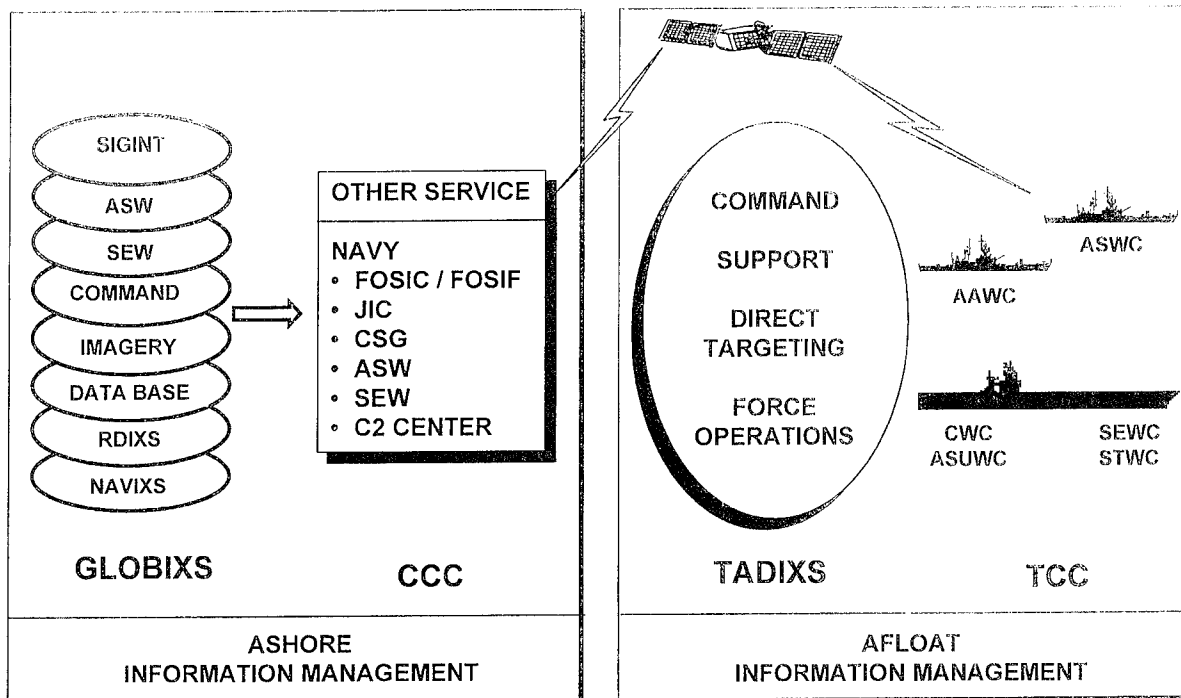
COMMS LINKS

SENSOR

SHOOTER
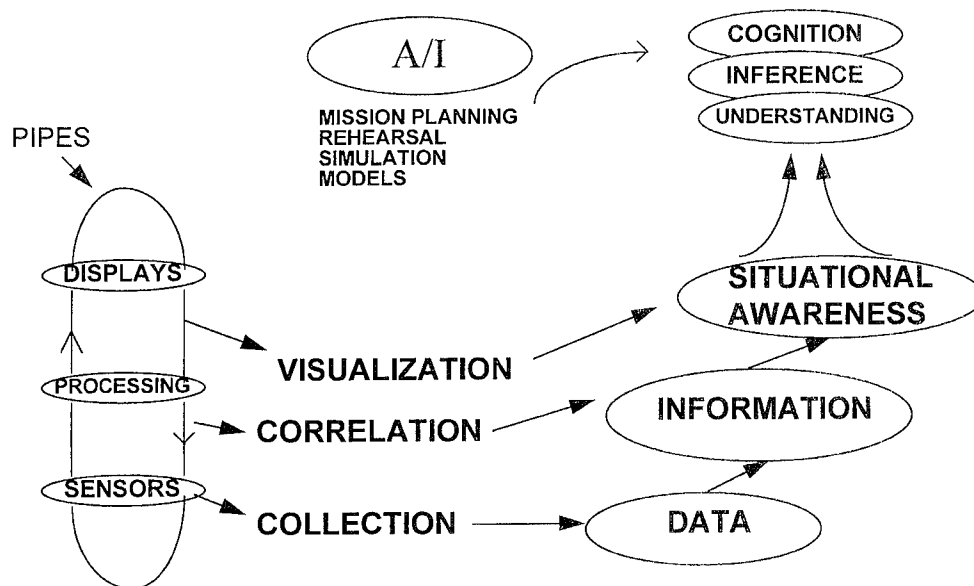
SHOOTER W/ SENSOR

NEW OPERATIONAL CONSTRUCT
ORGANIZED AROUND SENSOR-TO-SHOOTER COMPLEXES

- JOINT
  - MULTI-SERVICE
  - COMMON OPERATIONAL OBJECTIVE
  - MULTI-DIMENSIONAL (AIR / LAND / SEA)
  - MULTI-FUNCTIONAL (LAND ATTACK / CAS / DEEP STRIKE)
- FULLY INTEGRATED JOINT
  - COMMON TACTICAL OBJECTIVE
  - COMMON DOCTRINE
  - MUTUALLY SUPPORTING
  - SYNCHRONIZED / ORCHESTRATED
- COHERENT JOINT
  - ABILITY TO IMPROVISE COHERENTLY
  - ACCOMMODATES NATURAL OPERATING RHYTHMS
  - INHERENT UNITY OF EFFORT IN THE ORGANIZATION
  - COOPERATIVE INPUT . . . FOCUSED OUTPUT
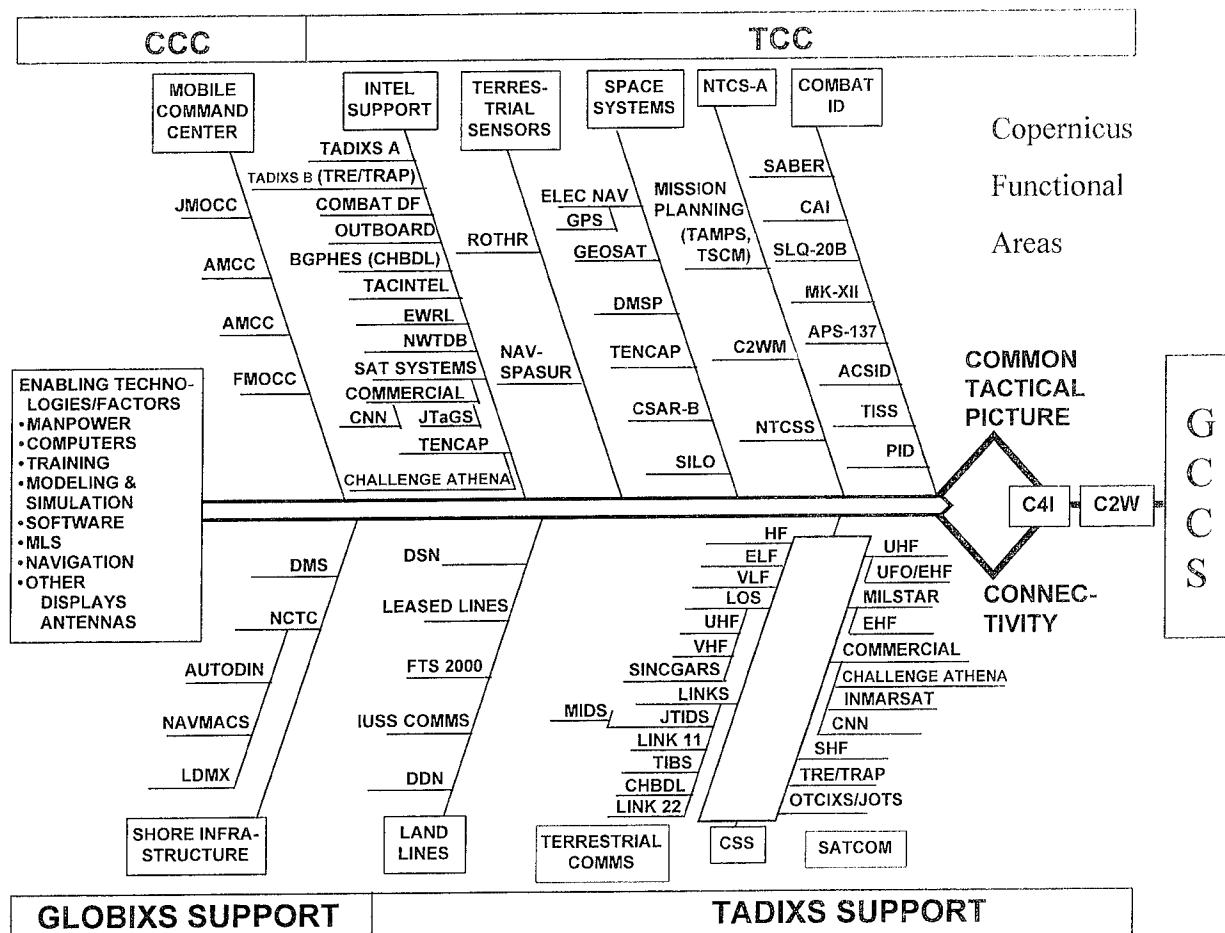
The Pillars of the Copernicus Architecture

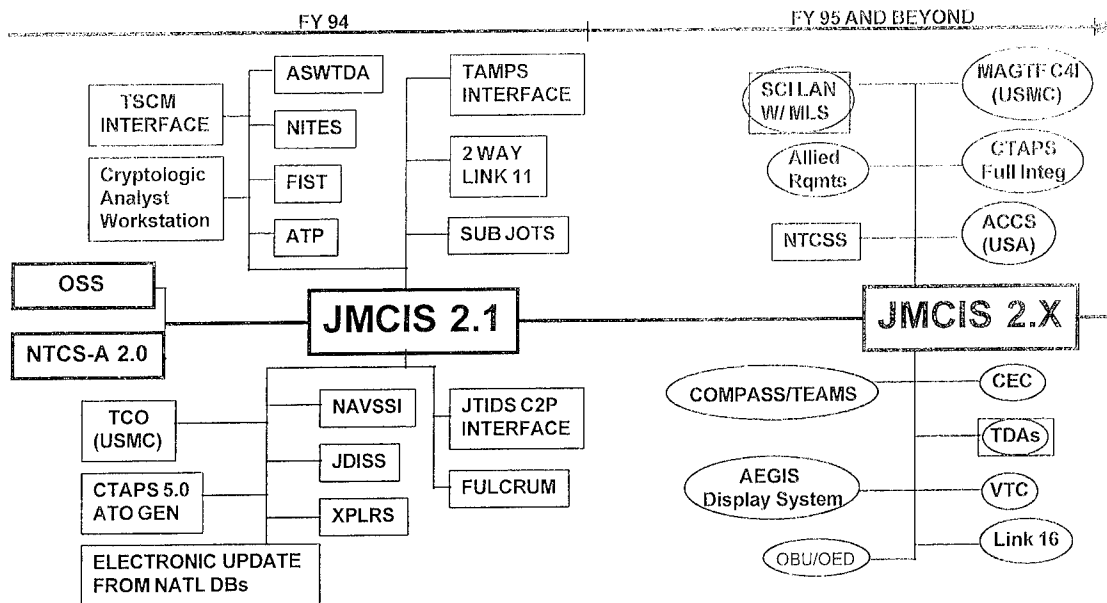
ASCENDING THE COGNITIVE HIERARCHY

MIGRATION SYSTEM

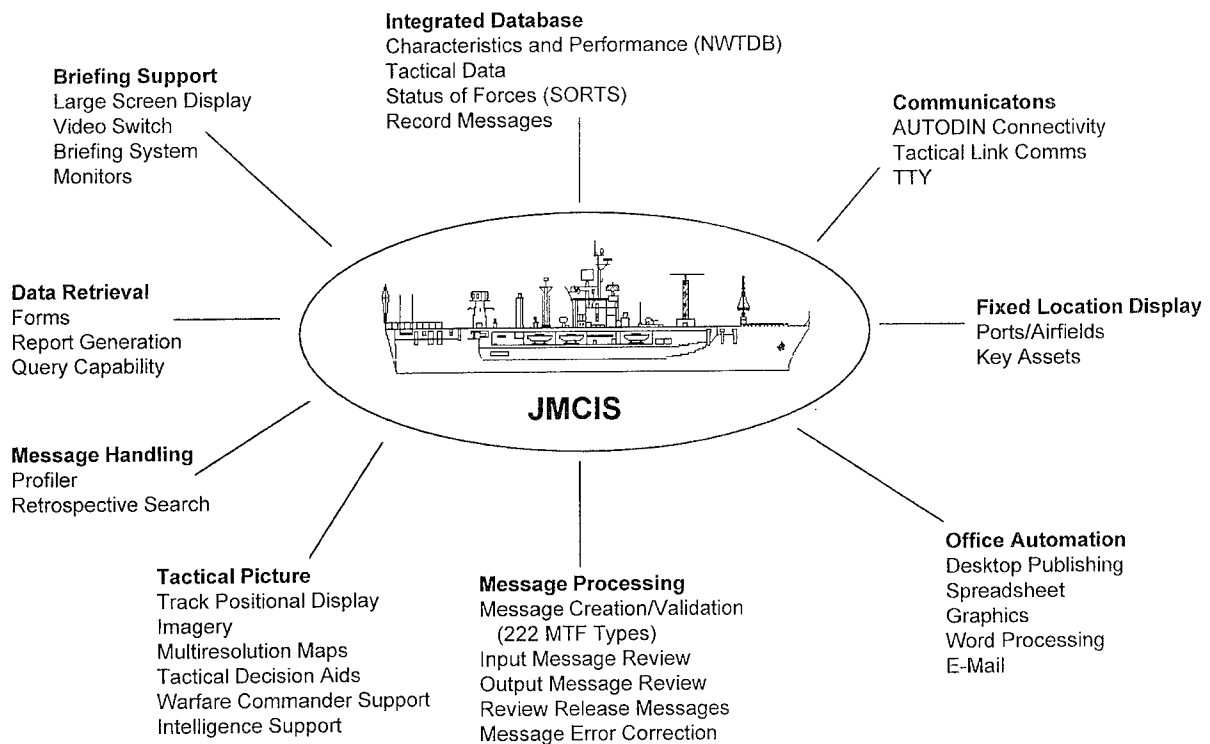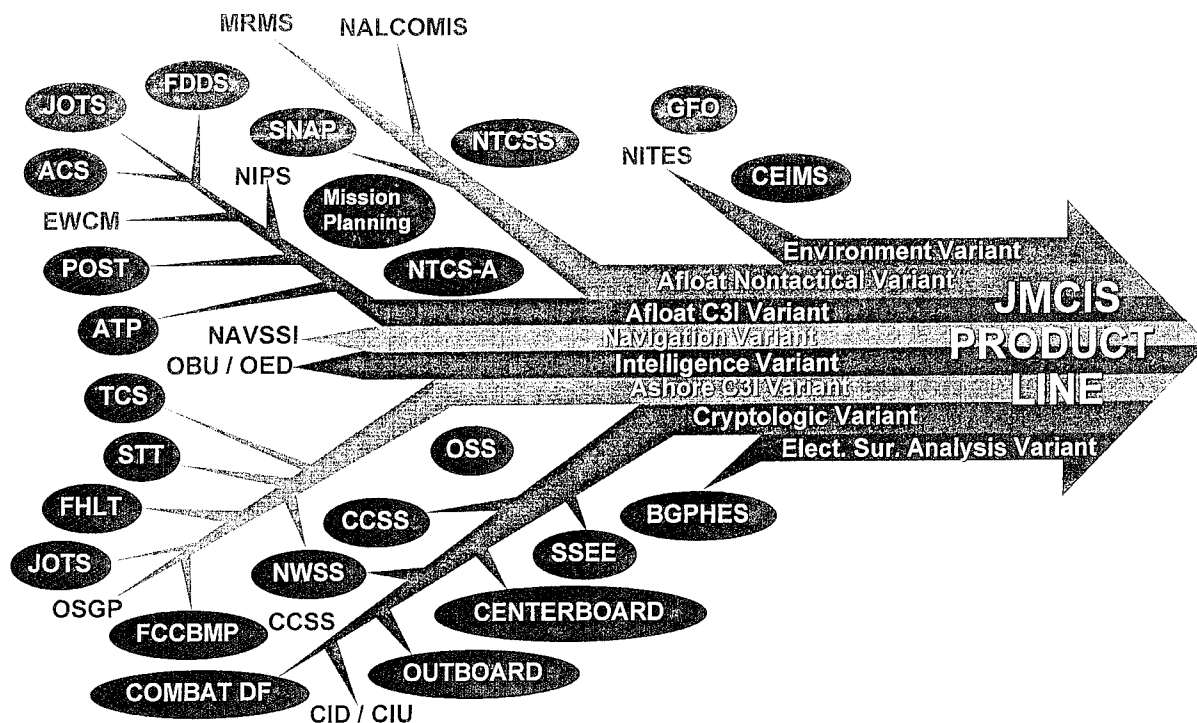## JMCIS

Joint Maritime Command Information System

CCC	TCC

MOBILE COMMAND CENTER

INTEL SUPPORT

TERRESTRIAL SENSORS

SPACE SYSTEMS

NTCS-A

COMBAT ID

Copernicus Functional Areas

TADIXS A
TADIXS B (TRE/TRAP)
COMBAT DF
OUTBOARD
BGPHES (CHBDL)
TACINTEL
EWRL
NWTDB
SAT SYSTEMS
COMMERCIAL
CNN   JTaGS
TENCAP
CHALLENGE ATHENA

JMOCC
AMCC
AMCC
FMOCC

ROTHR
NAV-SPASUR

ELEC NAV
GPS
GEOSAT
DMSP
TENCAP
CSAR-B
SILO

MISSION PLANNING (TAMPS, TSCM)

C2WM

NTCSS

SABER
CAI
SLQ-20B
MK-XII
APS-137
ACSID
TISS
PID

COMMON TACTICAL PICTURE

ENABLING TECHNO-LOGIES/FACTORS
•MANPOWER
•COMPUTERS
•TRAINING
•MODELING & SIMULATION
•SOFTWARE
•MLS
•NAVIGATION
•OTHER
    DISPLAYS
    ANTENNAS

C4I   C2W

G C C S

DMS
NCTC
AUTODIN
NAVMACS
LDMX

DSN
LEASED LINES
FTS 2000
IUSS COMMS
DDN

HF
ELF
VLF
LOS
UHF
VHF
SINCGARS
LINKS
JTIDS
LINK 11
TIBS
CHBDL
LINK 22

MIDS

UHF
UFO/EHF
MILSTAR
EHF
COMMERCIAL
CHALLENGE ATHENA
INMARSAT
CNN
SHF
TRE/TRAP
OTCIXS/JOTS

CONNEC-TIVITY

SHORE INFRA-STRUCTURE

LAND LINES

TERRESTRIAL COMMS

CSS

SATCOM

GLOBIXS SUPPORT	TADIXS SUPPORT

139

Joint Maritime Command Information System

```
FY 94                                              FY 95 AND BEYOND

TSCM          ASWTDA      TAMPS           SCI LAN         MAGTF C4I
INTERFACE     NITES       INTERFACE       W/ MLS          (USMC)

Cryptologic   FIST        2 WAY           Allied          CTAPS
Analyst                   LINK 11         Rqmts           Full Integ
Workstation   ATP         SUB JOTS
                                          NTCSS           ACCS
OSS                                                       (USA)
              JMCIS 2.1                   JMCIS 2.X
NTCS-A 2.0
                                          COMPASS/TEAMS   CEC
TCO           NAVSSI      JTIDS C2P
(USMC)                    INTERFACE                       TDAs
              JDISS
CTAPS 5.0                 FULCRUM         AEGIS            VTC
ATO GEN       XPLRS                       Display System

ELECTRONIC UPDATE                         OBU/OED         Link 16
FROM NATL DBs
```

FUNCTIONALITY

Integrated Database
Characteristics and Performance (NWTDB)
Tactical Data
Status of Forces (SORTS)
Record Messages

Briefing Support
Large Screen Display
Video Switch
Briefing System
Monitors

Communicatons
AUTODIN Connectivity
Tactical Link Comms
TTY

Data Retrieval
Forms
Report Generation
Query Capability

Fixed Location Display
Ports/Airfields
Key Assets

Message Handling
Profiler
Retrospective Search

JMCIS

Tactical Picture
Track Positional Display
Imagery
Multiresolution Maps
Tactical Decision Aids
Warfare Commander Support
Intelligence Support

Message Processing
Message Creation/Validation
  (222 MTF Types)
Input Message Review
Output Message Review
Review Release Messages
Message Error Correction

Office Automation
Desktop Publishing
Spreadsheet
Graphics
Word Processing
E-Mail

JMCIS EVOLUTIONARY DEVELOPMENT MODEL FOR C4I/CDS INTEGRATION

JMCIS Contribution to GCCS

- Original Navy GCCS Proposal
  - OSS provided "80%" solution for GCCS in 4/93
  - J6 sponsored Navy proposal to CINC J6 Conf in 5/93
  - J6 approval in 9/93
- US Atlantic Command (USACOM) Proof of Concept (POC)
  - USACOM HQ functional 10/93
  - POC demo with components 12/93
- Operational employment at USACOM
  - Agile Provider/Joint Task Force 95/Operation Restore Democracy
- JMCIS architecture/COE is the baseline for GCCS Version 1.1
  - Integration Tools/Integration Standard
  - COE Specification/GCCS On-Line Library(GOL)

Glossary

A

ACS	Afloat Correlation System
ASWTDA	Anti-Submarine Warfare Tactical Decision Aid
ATP	Advanced Tracking Prototype

B

BGPHES	Battle Group Passive Horizon Extension System

C

CCSC	Cryptologic Combat Support Console
CCSS	Combat Cryptologic Support System
CIU	Cryptologic Interface Unit
COTS	Commercial Off-the-Shelf
CTAPS	Contingency Theater Automated Planning System

E

EWCM	Electronic Warfare Control Module

F

FHLT	Fleet High Level Terminal

G

GCCS	Global Command and Control System
GOTS	Government Off-the-Shelf

J

JDISS	Joint Deployable Intelligence Support System
JMCIS	Joint Maritime Command Information System
JOTS	Joint Operational Tactical System

L

LFOC	Landing Force Operations Center

M

MAGTF C4I	Marine Air Ground Task Force - Command, Control, Communications, Computers and Intelligence
MRMS	Maintenance Resources Management System

N

NALCOMIS	Naval Aviation Logistics Command Management Information System
NAVSSI	Navigation Sensor System Interface
NDI	Non Developmental Item

NIPS	NTCS-A Intelligence Processing Services
NITES	NTCS-A Integrated Tactical Environmental Subsystem
NITES	Navy Integrated Tactical Environmental System
NTCS-A	Navy Tactical Command System - Afloat
NTCSS	Naval Tactical Command Support System
NWSS	Navy WWMCCS Support Center

O

OBU/OED	Ocean Surveillance Information System Baseline Upgrade / OSIS Evolutionary Development
OSS	Operational Support System

P

POST	Prototype Ocean Surveillance Terminal

S

SACC	Supporting Area Command Center
SNAP	Shipboard Non-Tactical ADP Program
SSEE	Ship's Signal Exploitation Equipment
STT	Shore Targeting Terminal

T

TAMPS	Tactical Aircraft Mission Planning System
TEAMS	Tactical EA-6 Mission Planning System
TESS	Tactical Environmental Support System
TESS	Tactical Environmental Support System
TFCC	Tactical Flag Command Center
TSC	Tactical Support Center

W

WWMCCS	World Wide Military Command and Control System

142

Marine Corps Information Technology Migration Strategy

[1]   Ladies and gentlemen, it is indeed a pleasure for me to describe to you the Marine Corps information technology migration strategy.

Executive Overview

- Enterprise Integration Strategy

- Software/Hardware Migration

- Processing/Communications Migration

- Acquisition Environment Migration

[2] I will describe our primary guidelines leading to enterprise-integration. First, I will describe our plans to run common software on common computer platforms interconnected by common networks. Then I will describe how this will be made possible by a migration to acquisition reforms and organizational changes unifying our acquisition process for information technologies.

Enterprise Integration Goal

■ **Single Source of Relevant Information for all Marine Commanders**

- Seamless   >>>>   Functionally Integrated

- Multimedia

- Disciplined   >>>>   Knowledge-based

- Multi-level Secure

- Near Real-time >>>   Push & Pull
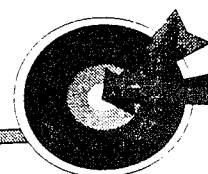
[3] Our goal is to provide the information required for our

warfighters and those supporting them in usable form, when its

needed. Due to rapid changes in warfare requiring sophisticated

and timely information for planning and situation awareness

extending to distant geographical locations, this can only be

accomplished by providing distributed multimedia systems with

access to non-organic sources involving multiple security levels.

Particular attention is necessary to avoid duplication and to

share information among functional subscribers by disciplined

methods of managing and presenting information that provides

knowledge and understanding to the user.

Current Environment

Intel   Log   Total Force   Tact Syst   Avn   Other
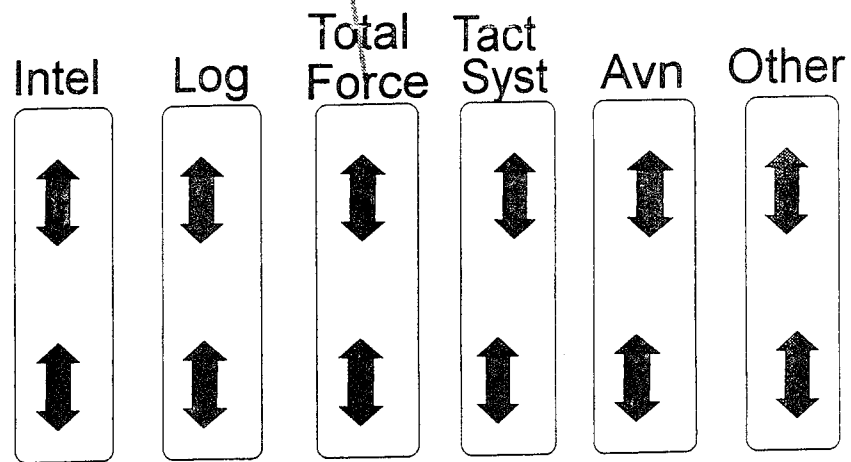
[4] To now, that has not been possible, since program managers

developed their programs in isolation and produced systems

often incapable of sharing information with each other.

Target Environment

Total   Tact
Intel   Log   Force   Syst   Avn   Other
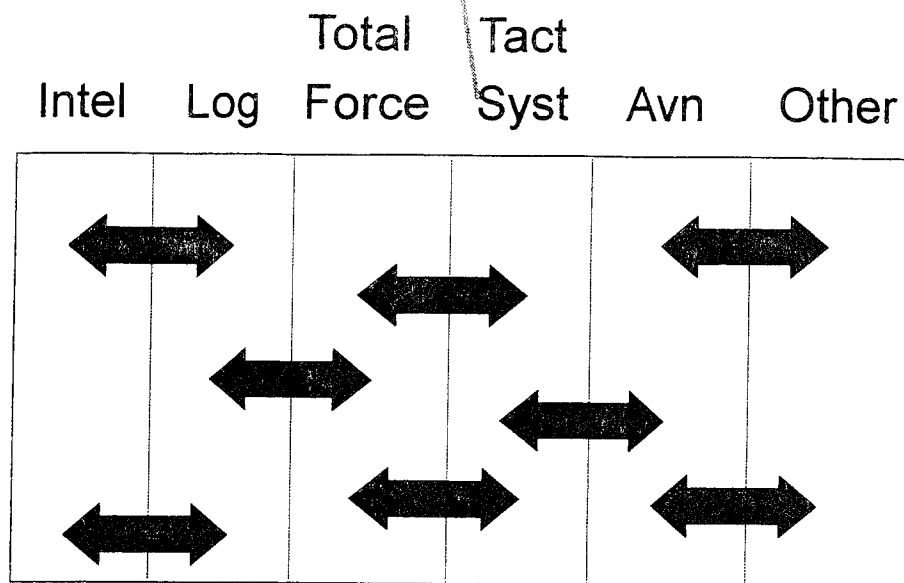
[5] But that's no longer the case in the set of Marine Corps

Air-Ground Task Force (MAGTF) C4I systems now beginning

to be provided to our warfighters and supporting establishment.

They will share information, software, platforms and networks

and be capable of adapting as a system of systems to all missions

anticipated in the future.

Enterprise Integration

■ An ongoing interative process

- redesign and <u>integrate</u> mission activities
- eliminate redundant or low-value functions
- enhance warfighting capabilities.

■ Standards-based information systems architecture can then support the redesigned functions.
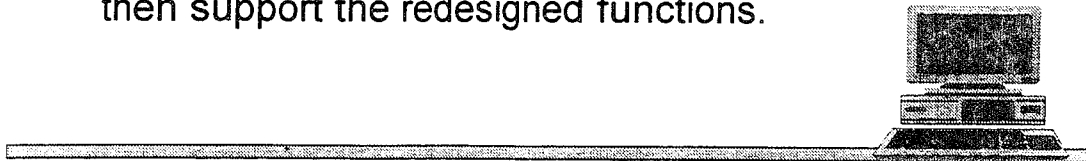
[6] However, the change from closed to open environments and

acquisition activities takes time. Particularly with

reduced resources available, progress requires innovative

approaches and is an iterative process. We must focus not just

on the technology, but the processes the technology is to

support. Therefore, we are undergoing comprehensive

functional process improvement activities throughout the

Marine Corps and building standards-based adaptive

information systems architectures to support the redesigned

functional processes.

Enterprise Integration

- Cross-functional Process Improvement and Integration
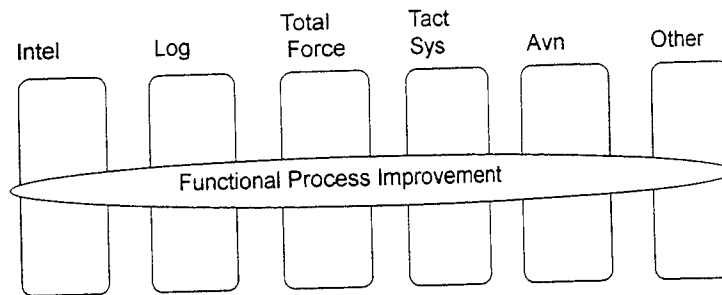
- Information System Support Plan

[7] The Marine Corps' functional process improvement

initiative is under the direct oversight of General Hearney the

Assistant Commandant and is expected to take several years.

The command and control area is one to receive early attention.

However, we are not waiting for these to all be completed to

develop plans for improving the information technologies to be

made available to support the improved processes. Actually,

one of the first areas we examined was the processes used in the

Marine Corps for the acquisition and life-cycle management of

information technologies.

USMC Enterprise Integration

Intel   Log   Total Tact   Avn   Other
              Force Syst

Common Operating Environment
Common Support Services
Common Interconnected Networks
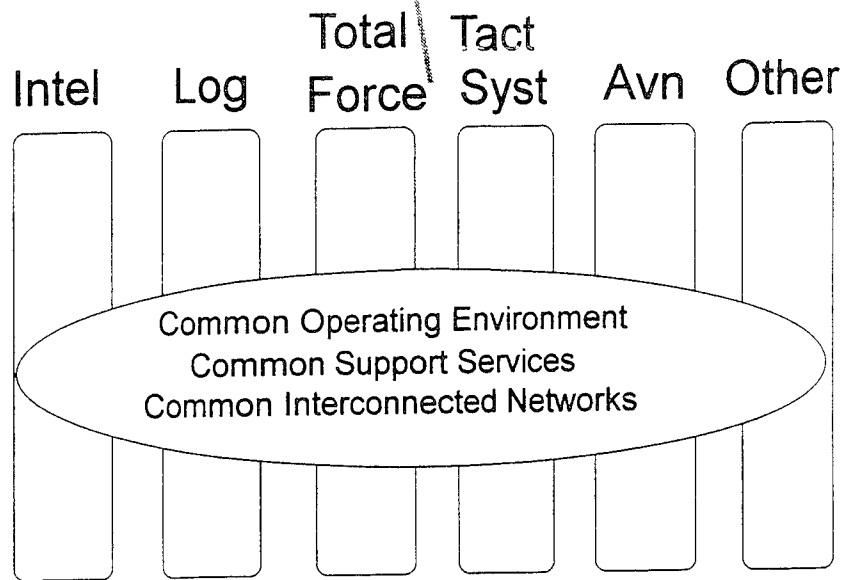
[8] That examination by a cross-functional Information
Technology Planning Group led to recommendations and a plan
to completely change the technical, acquisition and
organizational elements of those processes to more effectively
provide the support needed while providing the adaptability
needed to respond to joint and combined warfare requirements
in the modern era. Those changes were approved by an
executive steering group and are already being implemented.
The foundation for the revised process is that all Marine Corps
systems will be built upon a common operating environment
with common software support services, common hardware
suites and interconnected by common networks.

Current Architectures
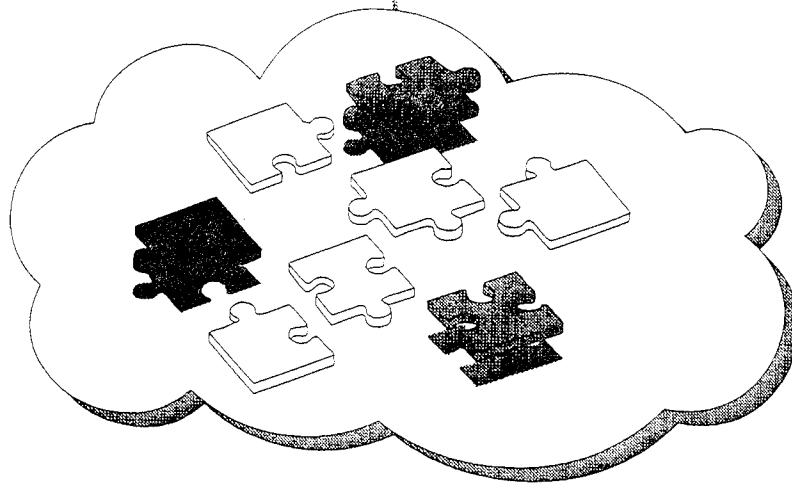
[9] As I said, in the past we had multiple information systems

architectures in the Marine Corps, most oriented around

functions, but some based upon deployed force systems and

separate administrative systems, as well as regionally oriented

systems.

Target Architecture

Applications				
Intel	Aviation	Fire Support	Maneuver	Logistics
IAS	ATACC	AFATDS	TCO	MCSSC2

Application Program Interfaces

Common Software

JMCIS/GCCS   C O E

Common Hardware

TAC-X Family of Computers
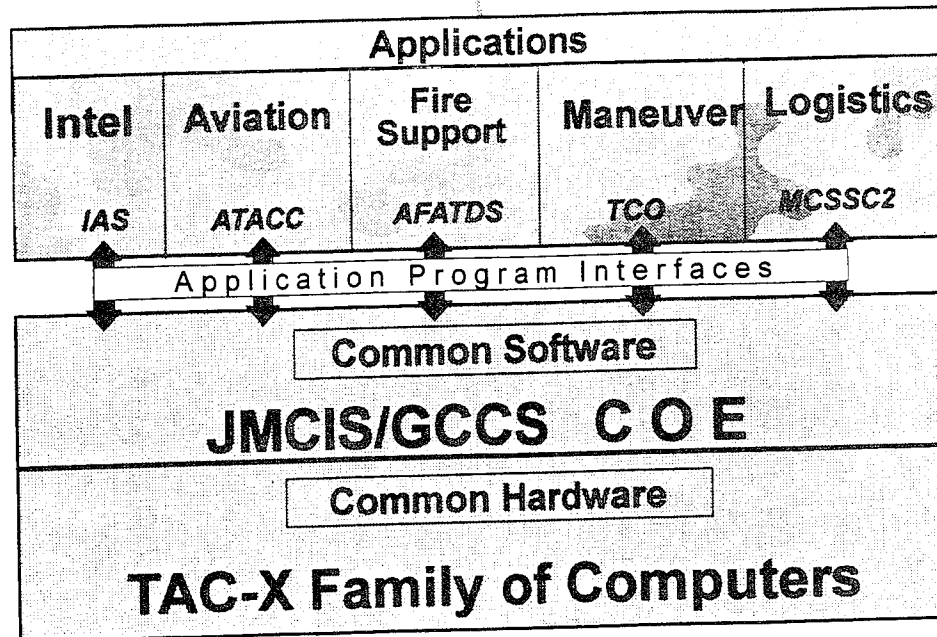
[10] No more, in the future, the Marine Corps has one target architecture built upon common computer and software programs of the Navy and joint command and control community. Individual functions are supported by application software with interfaces capable of being ported in a plug and play manner.

Characteristics of MAGTF C4I Software Architectures

CURRENT $ IN MILLIONS

PDSS Requirement

Programmed Funds

	FY93	FY94	FY95	FY96	FY97	FY98	FY99
Rqmts	20.0	27.1	32.8	36.0	38.9	40.2	41.6
Funding	20.0	24.7	25.2	26.5	27.4	28.4	29.3
Fund Shortfall	0.0	2.4	7.8	9.5	11.5	11.8	12.8
of Systems	14	17	21	23	23	23	23
Level of Supt	4.0	3.4	2.7	2.5	2.4	2.4	2.4

4 fold increase in the number of fielded MAGTF C4I systems.

Lines of Code: Millions

1970 1975 1980 1985 1990 1995 2000

37 Programming Languages:	29 Unique Hardware Platforms:
ADA	SUN SPARC Workstation
C/C++	AN/UYK-X
CMS	VAX
FORTRAN	Data General
Assembler	DOD Unique
etc.	etc.

[11] The necessity of such an approach is made clear by this chart which indicates in the upper left corner the dramatically increasing delta between costs to maintain software for increasing numbers of C4I systems (indicated on the right) compared to funds available. It is important to note that the 4 fold increase in systems involved 37 programming languages and 29 unique hardware platforms.

Software Redundancy

- 70% of the code within MAGTF C4I systems was functionally redundant.
- Each system was "building its own".

Mapping/Overlays	Portray, zoom, pan topographic information and access DMA mapping products related to terrain features, with ability to superimpose overlay graphics.
Imagery	Display photographic imagery.
Track Management	Display land symbology and maintain track related information on air/ground platforms.
PLI	Receiving Position Location Information associated with Air/land Unit locations.
Message Processing	Receive, parse, journal, format and transmit binary and text message traffic in accordance with predefined DOD formats.
TADIL Management	Management of TADIL A, B, and J message traffic, to include receiving, conversion, and forwarding capabilities.
Comm Processing	Communication processing of traffic across multiple communications paths.
Correlation	Correlation of unit information received form multiple sources.
Security Shell	Security Shell providing access control to tactical information.
System Admin	Systems Administration/Network Administration/Database Administration housekeeping functions.

[12] Obviously, we could no longer continue to provide the needed capabilities with available resources. In response to the situation, we had some smart Marines look for another way. They found that 70% of the code in our C4I systems was functionally redundant with each program manager building his own software "from the ground up" in isolation. Many common services were found which could share software if care was applied in its preparation so that it would be platform independent and program management procedures were adapted to allow the use of shared common core software services.

155

Technical & Acquisition Strategies

- Clearly recognize FMF requirements.

- Shoppers vice developers.

  ► NDI/COTS/GOTS, Open Systems.

- Look to the Navy first.

- Adopt evolutionary acquisition.

  ► Accept "core" solutions ➡ enhancements to core.

---

[13] But, it was also clear that we needed more than changing to common software and computer platforms to be able to expedite the fielding of more and improved capabilities to the Fleet Marine Force with reduced resources. We needed to reform other technical and acquisition strategies. Other innovative approaches were necessary. We looked at the world around us for existing Naval, Joint and commercial products that could meet the majority of our needs. We needed to become shoppers - and developers ONLY AS A LAST RESORT. We looked to the Navy first for solutions to our challenges. We also wanted to more rapidly get capability in the hands of the Fleet Marine force. Our conclusion was to field less than perfect solutions now and upgrade them over time using an evolutionary acquisition process. We quickly discovered the capability we were looking for. It was something called the Joint Maritime Command Information System (JMCIS) Unified Build (now called the Common Operating Environment,

JMCIS COE

Application Program Interface				
Comm / MSG Processor	Track Database MGR / Correlator	Local DB MGR	Security Shell	Chart / TACPLOT
X-Windows		MOTIF		
UNIX Operating System				
DTC-2	TAC-3		TAC-4	TAC-X
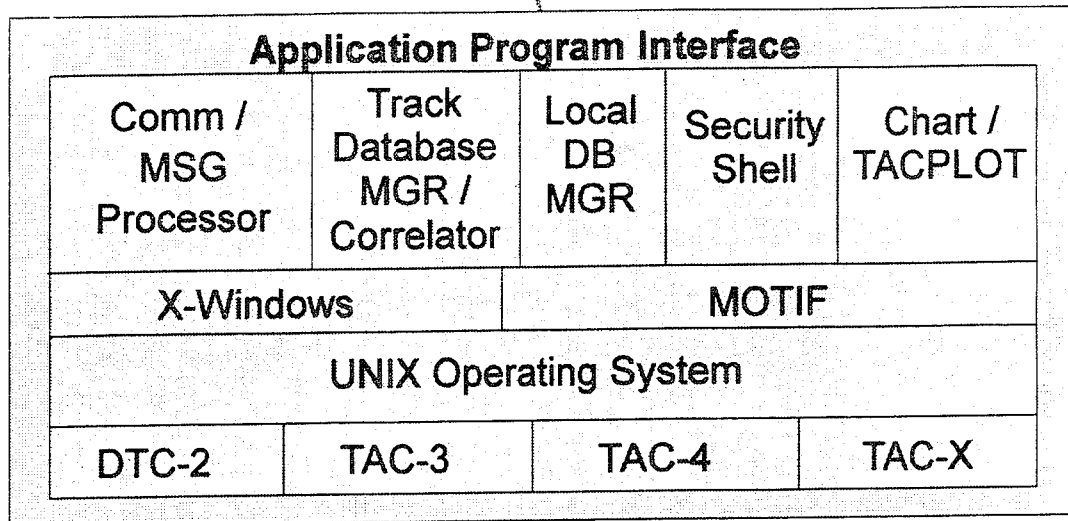
[14] The JMCIS COE provides much of the functionality we were looking for in a common software suite capable of running on common hardware. It consists of a common hardware backbone, a common operating system and common software support services which provide the common functionality we had envisioned.

Specific Examples of the Marine Corps Migration Strategy

Source Lines of Code

Air Defense 340K SLOC

Situation Display Graphics Proc
Track Mgt
Radar Linkage Master DB
Control/Spt Msg Processor

300K
200K
100K

81% reduction in software associated with these Mission Areas; with SAME functionality.

Intel Anal 109K SLOC

Exec/Comms DB Mgt Intel Analysis

Air Defense 47K SLOC

Air Ops Segment

Intel Anal 36K SLOC

Intel Segment

Application Programming Interface

Comm / MSG Processor	Track Database MGR / Correlator	Local DB MGR	Security Shell	Chart / TACPLOT
X-Windows			MOTIF	
UNIX Operating System				
DTC-2	TAC-3		TAC-4	TAC-X

[15] This slide shows the results of some preliminary analysis done by our software support experts at the Marine Corps Tactical Systems Support Activity (MCTSSA) (though you'll soon hear that their mission now expands beyond deployable systems to support all Marine Corps systems). The first example is an air defense C2 program. MCTSSA estimates an 81% reduction in the amount of code they will have to support by employing the JMCIS COE in this program. In the second example, an intelligence analysis system, MCTSSA believes they will see a 67% reduction in the lines of code for which they will have to provide post deployment software support.

Software Component of the Marine Corps Migration Strategy

Spectrum Management:
    Systems Planning Engineenng Evaluation Device

64% Reduction

Fire Support
    Advanced Field Artillery Tactical Data System

Intelligence Production/Dissemination
    Intelligence Analysis System
    Tactical Remote Sensor System
    Tactical Electronic Reconnaissance
      Processing and Reporting System
    Tactical Control Analysis Center

Airspace Mgt/Air Operations
    Advanced Tactical Air Command Cental
    Improved Direct Air Support Central
    Air Defense Communications Platform

62% Reduction

84% Reduction

Land Operations
    Tactical Combat Operations
    Position/Location Reporting System
    MAGTF Tactical Warfare Simulator

45% Reduction

Application Programming Interface				
Comm / MSG Processor	Track Database MGR / Correlator	Local DB MGR	Security Shell	Chart / TACPLOT
X-Windows		MOTIF		
UNIX Operating System				
DTC-2	TAC-3	TAC-4		TAC-X

[16] As you can see, we expect to similar reductions in the

amount of code we will have to support across all functional

areas [[REVIEW CHART[[.

But, we are looking to the Navy for not only software, but

hardware as well.

Current Common Hardware
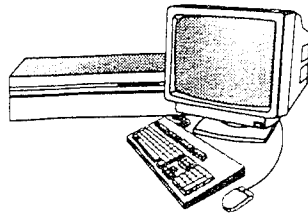
Class A
Workstation/File Server
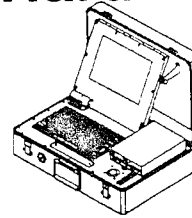
Class B
Network Workstation
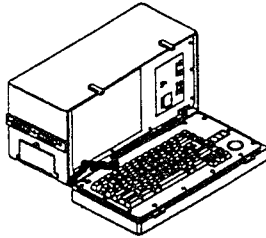
Class C
Lightweight Tactical Computer
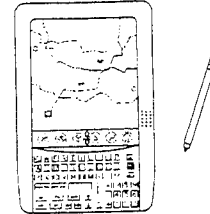
Class D
Pocket Tactical Computer

[17] Currently, our Marine Corps Common Hardware Suite (MCHS) consists of the four classes of computers you see here. They range from the Class A computer capable of serving as a network server, to the Class D, which is a handheld device that will fit in your pocket. We currently depend on other Services or agencies for contract vehicles for each of these computers. For example, we order Class B machines through contracts at the National Photographic Interpretation Center (NPIC) and the Navy's Information Systems Engineering activity at St Inigoes, Maryland. The Class C machines are ordered through the Army's Program Manager for Common Hardware at Ft Monmouth, N.J. In nearly every case, the Service or agency which owns the contract has a different integrated logistics support philosophy than ours. Consequently, we have had to ask them to modify their contracts to obtain the types of data we need to apply the Marine Corps' maintenance management concept to the machines. (This increases costs.) Also, usually, we've had no input to the original design of these boxes. In other words, it has been painful to depend on diverse sources for computer hardware and its maintenance. We intend to change this.

Migration to TAC-4

Class A
Workstation/File Server

Processor A/C

Class B
Network Workstation

Processor F
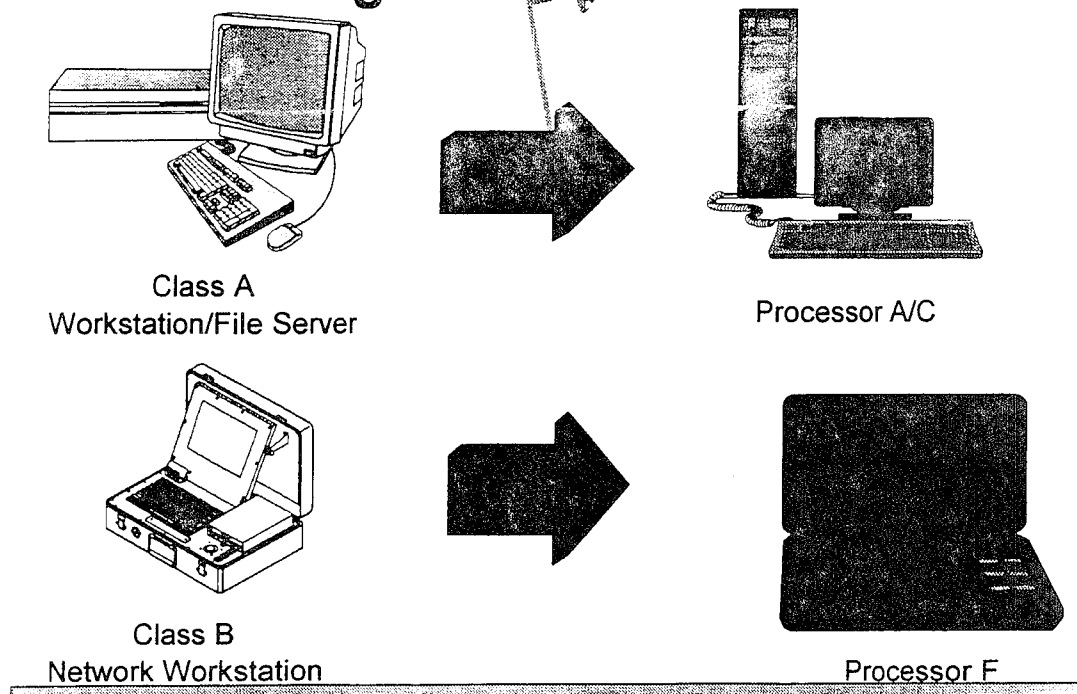
[18] The Navy has a Tactical Advanced Computer (TAC)

program, To capitalize on the many advantages of this program,

the Marine Corps has collaborated in the development of

specifications for the fourth version (called TAC-4). Our

maintenance concept and environmental requirements are now

reflected in TAC-4 documentation. We also were active

participants in the TAC-4 procurement process. We are

counting on TAC-4 to provide a common source of follow-on

computers for our Class A and B common hardware suite

requirements.

So, when you put TAC-4 and JMCIS together with our Marine

Corps C4I programs, this is what you get ...

MAGTF C4I: JMCIS Architecture

Applications				
Intel	**Aviation**	**Fire Support**	**Maneuver**	**Logistics**
IAS	*ATACC*	*AFATDS*	*TCO*	*MCSSC2*

Application Program Interfaces

Common Software

JMCIS/GCCS C O E

Common Hardware

TAC-X Family of Computers
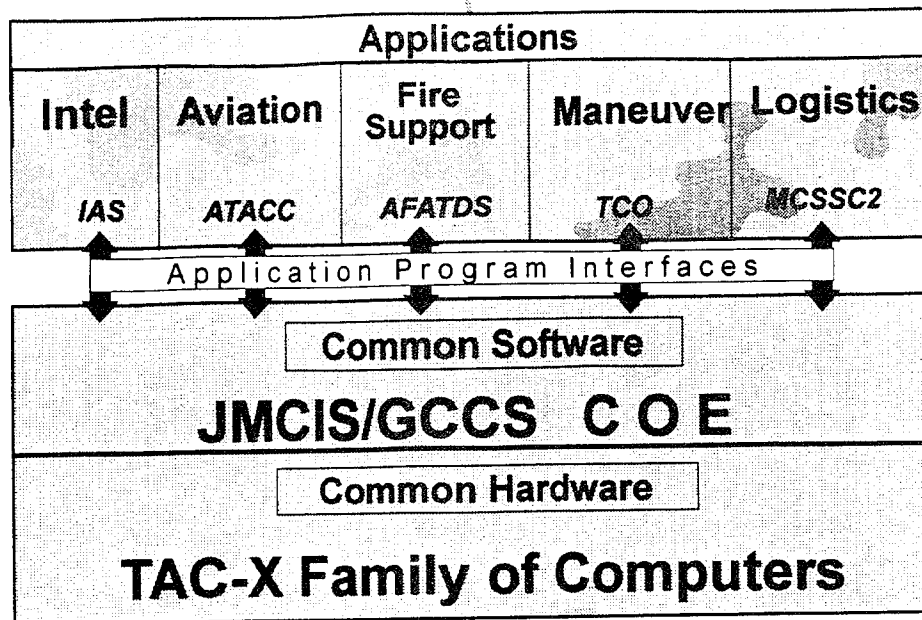
[19] Our common hardware suite foundation will consist of TAC computers. Our common software will be JMCIS COE transitioning to GCCS. Well documented, well defined application interfaces (APIs) are key to this strategy. These APIs define how applications software plugs into common core software upon which it depends. Applications and core software changes may occur but APIs remain constant. We also continue to work closely with the Navy to evolve Marine Corps required capabilities into JMCIS. A good example of capabilities we have already incorporated into JMCIS is "coordinate conversions" - the Navy works in nautical miles and latitude/longitude while Marines talk in terms of kilometers and the Military Grid Reference System.

Benefits of JMCIS/GCCS Migration

- Hardware and Software Commonality with Other Services

- Focus on Unique Functionality

- CCB Membership

- Cost Sharing

- Joint Certification

- Common Style Guide

- API Compatibility

- Interoperability / Integration

- Common Training

- PDSS Costs

[20] Although I have alluded to many of the benefits of a Marine Corps migration to Naval and Joint hardware and software, here are some of the key considerations.

[REVIEW BULLETS ON SLIDE]

Migration Drivers

- BRAC-93: Directed 3 out of 6 Major Data Centers to Close

- DMRD-918: Migration to Defense Information Infrastructure

- Likely Effects of BRAC Directed Closures:
  - Diverging Standards
  - Higher Costs
  - Diminished Support

- Solution: Consolidate All Major Data Centers using a Standards Based Approach

[21] Now, let's look at the Marine Corps' migration to a single mainframe processing center and wide area network run by DISA as part of the Defense Information Infrastructure. You are certainly aware of the BRAC-93 and DMRD-918 decisions. Together, these and other considerations led the Marine Corps to decide to expedite consolidation of its processing and network support by leading the way in implementing comprehensively the underlying goals of these initiatives.

Current Architecture

Defense Data Network

Marine Corps Data Network
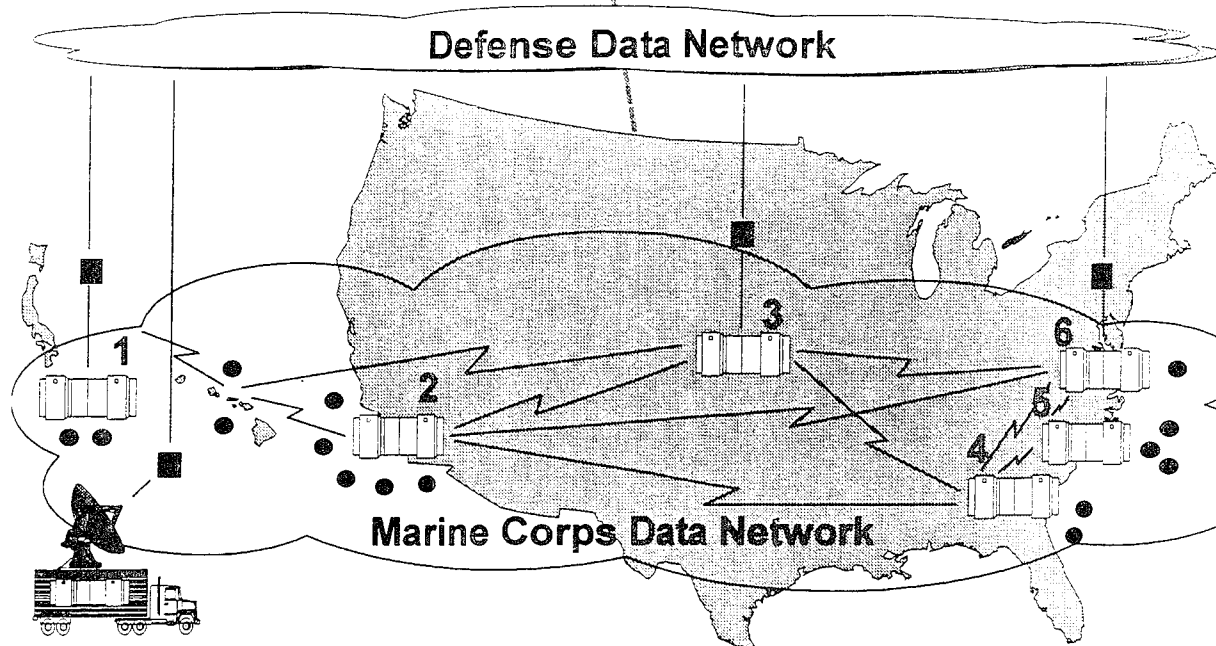
1-Okinawa, JA; 2-Camp Pendleton,CA; 3-Kansas City,MO; 4-Albany,GA; 5-Camp Lejeune,NC

[22] We will move from the current architecture depicted here.

It consists of six geographically dispersed data centers

interconnected by a single integrated data network, augmented

by a mobile data center. As you refer to the legend, you can see

the locations of these data centers.

Target Architecture

Defense Information Systems Network
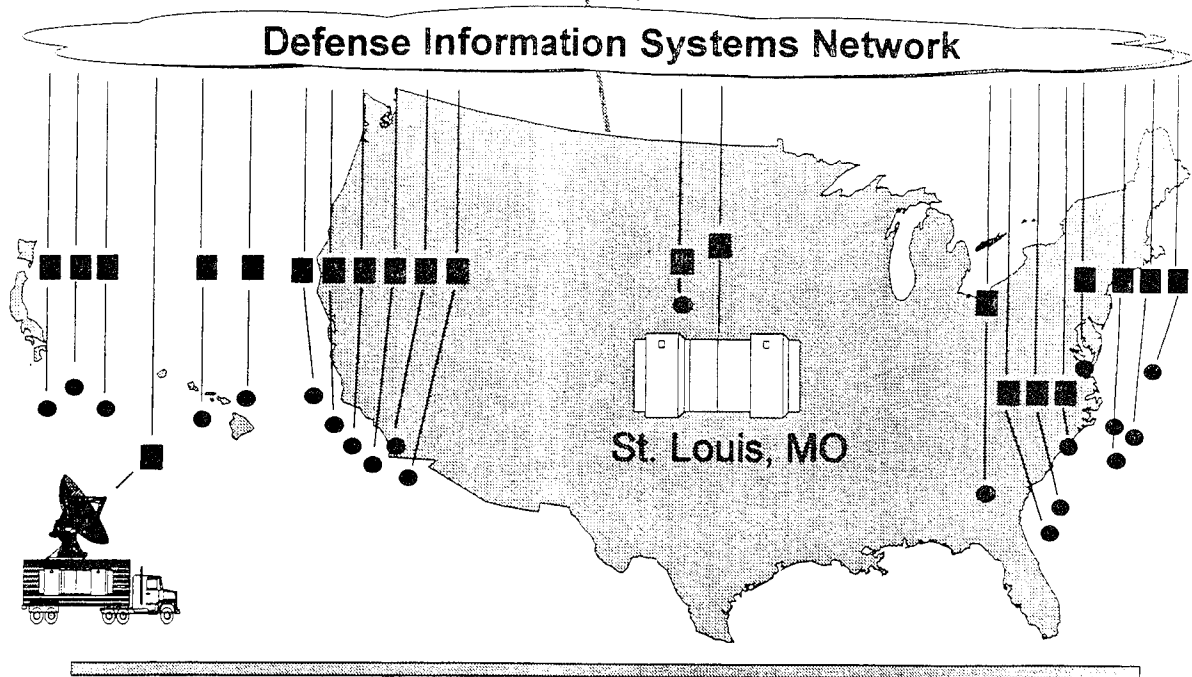
St. Louis, MO

[23] Our TARGET architecture, depicted on this slide consists

of all sites interconnected by the Defense Information Systems

Network (DISN) and a single Defense Megacenter at St Louis,

Missouri.

Current Architecture
Characteristics

- Standard Hardware

- Standard Software

- Single Data Communications Network

- Integrated System and Network Management

- Few "Black-box" Interfaces to DDN

[24] Let's look at some characteristics of the current architecture, then compare them to the target. All data centers maintain standard software platforms, identical commercial off-the-shelf software products are used on each computer, and our single inter-computer network and data centers are managed by the Marine Corps Computer and Telecommunications Activity at Quantico, Virginia. There are three interfaces from the Marine Corps Data Network (MCDN) to the Defense Data Network (DDN). These are at Okinawa, Kansas City and Quantico.

Current Architecture
Characteristics

- "Twenty-two" Geographic Regions Supported
  - One Wartime Contingency
  - Sixteen CONUS
  - Five O-CONUS

- Support Configurations
  - One Deployable Processing Center
  - Six Major Data Centers
  - Fifteen Remote Job Entry (RJE) Sites

[25] Continuing our look at the current architecture, we support

twenty-two geographic regions (16 CONUS/5 OCONUS/1

DEPLOYABLE FOR DEPLOYED OPERATIONS). The

non-deployable units consist of 6 major data centers and 15

remote job entry sites (RJEs). The RJEs are supported by the

major data centers at other bases, posts, camps and stations. The

deployable force automated services center is a mobile data

center and has proven very effective and reliable in Operations

Desert Shield/Storm and Restore Hope.

Target Architecture
Characteristics

■ Same "Logical" Standard Hardware

   – Megacenter partitioned as six logical mainframes

   – Major Data Centers reconfigured as RJEs

■ Same Standard Software - running in partitions, until migration systems fielded

■ MCDN absorbed into DISN - circuits adjusted as needed

■ Integrated System and Network Management Responsibilities - transferred to DISN

[26] Compared to the CURRENT architecture, you will find

the characteristic environment in the TARGET very familiar.

[REVIEW BULLETS]

Target Architecture
Characteristics

■ Multiple "Black-box" Interfaces to DISN

■ Same Regions Supported

■ Support Configurations
  - One Deployable Processing Center
  - One DoD Megacenter
  - Twenty-one Remote Job Entry Sites

[27] Continuing the comparison, you'll note increased

connectivity to the DISN from the same Regions, but with a

single consolidated Megacenter supporting 21 RJEs.

Net Result: Same Support
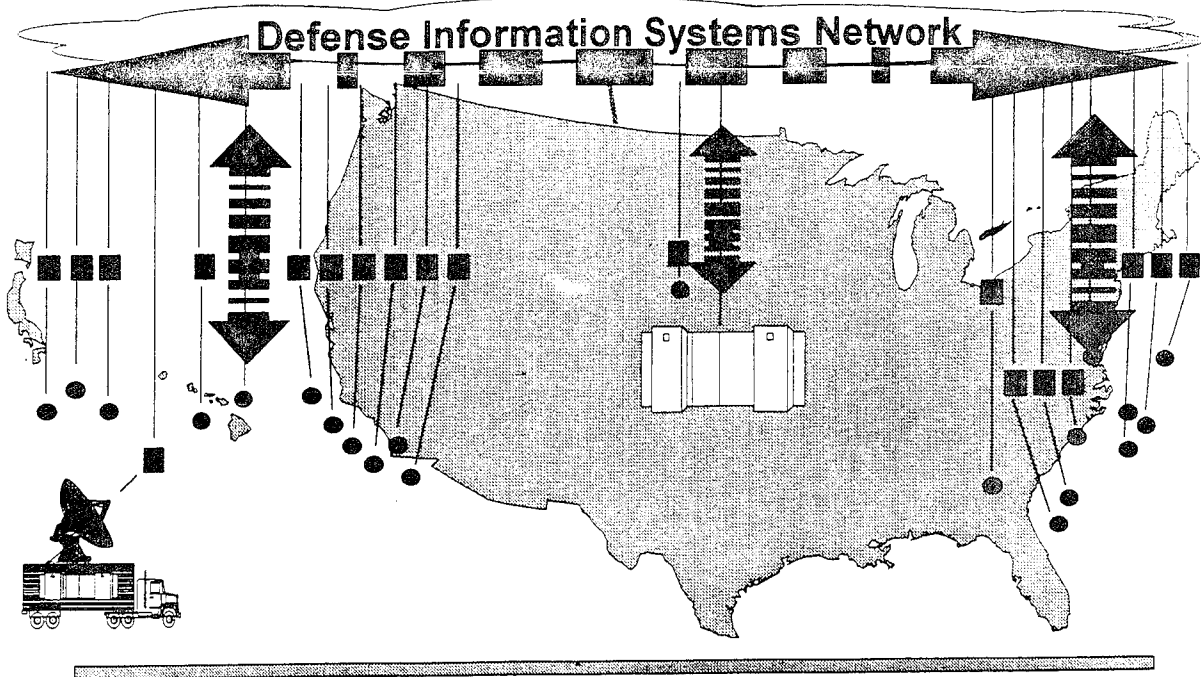
[28] The net result after our migration to the DoD Megacenter

is the same support to our end users, but we will have become

part of the global Defense Information Systems Network in

accordance with current DoD initiatives.

Unified IT Acquisition Environment

- Diverse Organizations Currently Responsible for IT Architecture, Standards, Acquisition and LCM within USMC

  - Tactical Data Systems: MARCORSYSCOM, MCTSSA,

  - Non-Tactical AIS: Funcs, MCCTA, CDAs

- "Stovepipe" Environment Encourages Proliferation of Redundant, Non-Interoperable Systems

- Discourages "Unified Build"

[29] But, as I noted earlier, more acquisition reforms were needed to effectively implement those I've described. It was necessary to unify diverse acquisition processes for deployable systems and those of functional sponsors and the supporting establishment, in order to truly unify our systems into a seamless architecture.

Unified IT Acquisition Environment

- July 1993, ESG Determined that:
  - MARCORSYSCOM should exercise single acquisition authority
  - CG MCCDC should assume oversight of ISSC

- March 1994, ITPG Formed to Make Recommendations to Achieve Those Goals

[30] During recent months, decisions by the Marine Corps leadership have led to organizational, policy and procedural changes to unify the acquisition decision authority and requirements responsibilities at the Marine Corps Systems Command and the Marine Corps Combat Development Command at Quantico, Virginia.

Unified IT Acquisition Environment

■ ITPG Recommendations:

- All IT requirements to include IT Architectures and standards fall under cognizance of CG, MCCDC

- MDA for ALL IT should reside with COMMARCORSYSCOM

- PM for hardware, telecommunications and operating systems software should be under COMMARCORSYSCOM

- PM of software application segments should remain with functional sponsors.

[31] As recommended by a Marine Corps Information Technology Planning Group, except for some special applications software for unique functions, all hardware and software for Marine Corps computer and communications will be handled by the Marine Corps Systems Command, currently commanded by MAJGEN Carol Mutter.

The Combat Development Command will be the maintainer of a single integrated standards based architecture supporting requirements maintained there. These two commands will be tightly linked by a common Information Technology Steering Group which includes representation by functional users and policymakers in its membership.

Unified IT Acquisition Environment

■ Benefits:

- – Eliminates arbitrary boundary between garrison and "tactical" systems

- – Reduces redundant development and "stovepipes" through horizontal integration

- – Ensures interoperable systems are integrated into a common hardware, software, and telecommunications infrastructure.

[32] This provides the final element needed in the reengineered process to ensure a truly integrated Marine Corps information infrastructure in the future which is built tightly around the evolving DoD information infrastructure (DII).

Summary

- Enterprise Integration Strategy

- Software/Hardware Migration

- Processing/Communications Migration

- Acquisition Environment Migration

[33] The migration strategy I have described to you will ensure

a truly integrated Marine Corps enterprise built on common

software, hardware and processing services linked by a common

seamless network supported by a common community of

acquisition professionals applying acquisition reforms which

expedite improved warfighting capabilities with fewer resources.

176

Air Force
Global Command and Control System
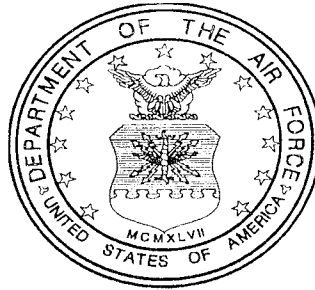
Col Joe Narsavage, Jr.

Director of Mission Systems

Headquarters, USAF

HQ USAF/SCM

13 Dec 94

AF Global Command and Control System

OVERVIEW

- **USAF View of GCCS**
- **AFGCCS Strategy**
- **Implementation of AFGCCS**
  - **Migration of C2 systems**
- **Relation to AF C4I HORIZON Concept**
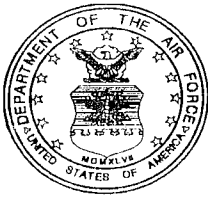
USAF VIEW

Concept: flexible and iterative approach allowing command and control (C2) applications to reside on a common operating environment (COE) supporting Commander-in-Chief (CINC) and Joint Task Force (JTF) operations.

Product: a collection of C2 systems, operating on that COE, that may vary from customer to customer.

Global Command and Control

GCCS provides a core of functionality that...
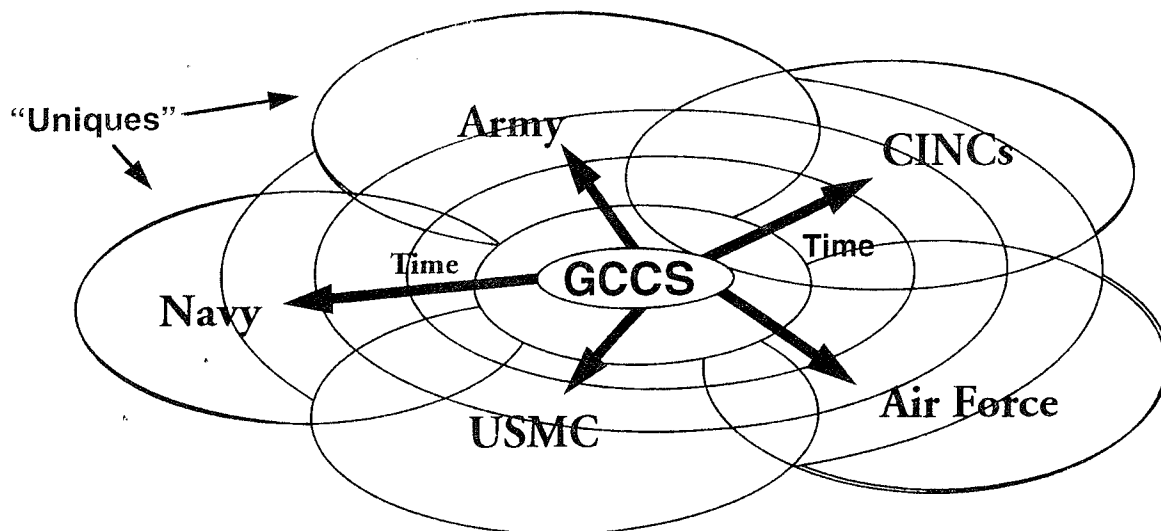
... establishes a common C2 standard.

AF Global Command and Control System

AFGCCS Strategy

- Have warfighter define operational requirements
- Evolve system functionality
- Develop GCCS Common Operating Environment
- Migrate C4I applications

AF Global Command and Control System

AFGCCS Implementation Tasks

- Worldwide Military Command and Control System (WWMCCS) shutdown
- Common Operating Environment (COE) development
- C2 migration

USAF C2 Migration Process

- Identify critical functionality requirements
- Select C2 migration system candidates
- Modify programs to incorporate GCCS COE

AIR CAMPAIGN PLANNING PROCESS

B
A
T
T
L
E

D
A
M
A
G
E

A
S
S
E
S
S
M
E
N
T

Contingency Theater
Automated Planning Sys (CTAPS)

**AIR OPS CTR/
AIR TASKING ORDER
PROCESS**

**TIME-PHASED
FORCE DEPLOY DATA
PROCESS**

Wing C2 Sys
(WCCS)

**WING
COORD**

C2 Info Proc
Sys (C2IPS)

**MOBILITY
PROCESS**

**AIRLIFT C2
PROCESS**

**SQ MISSION
PLANNING**

MOBILITY
TASKING

AF Mission
Spt Sys (AFMSS)

**WING/
BATTALION**

AIRLIFT
SCHEDULE

Global Trans
Network (GTN)

**AIRCRAFT
SORTIE**

AIR FORCE GCCS

CINC/JTF

CTAPS

GCCS
CTAPS
GTN

AFFOR

WING

WCCS
C2IPS

NATIONAL INTELLIGENCE THEATER

PERSONNEL

MOBILITY

SUPPLY

COMMON DATA BASE

FUELS

AMMUNITION

Migration of Air Force C2 Applications

C2 Systems

CTAPS	GDSS
CADS	ACES
CAFMS	AIMS
JMI	MAIRS
ASDS	TAMS
TISD	TKACT
3DS	ADANS
JAMPS	AAA
CTIS	CRQS
WCCS	FLOGEN
CIS	HORSEBLANKET
JMAPS	MMS
JMPS	REPGEN
C2IPS	CMARPS
EARLO	CMARPS (SAC)
TAMS	SORTS-DIS
CAASS	WMP 3/5
WINGS	COMPES
AFMSS	CFMS
MSSII	CSMS
SMDPS	FAST
FPLAN	HAF COMPES
MDPS	
CMPPS	
STAMPS	

Migration

TBM	AFMSS
CTAPS	MOBILITY SYS
WCCS	ADANS
C2IPS	GDSS
CIS	CMARPS
JMAPS	
JMPS	

Target AFGCCS

GCCS
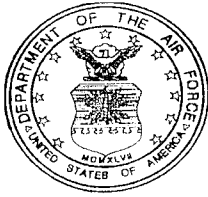
AF Global Command and Control System

AFGCCS Migration Approach

Combat Intel System

Contingency Theater Auto Plan Sys

Wing Cmnd & Ctrl Sys

C2 Info Proc Sys

AF Mission Spt Sys

Global Decision Spt Sys

Conventional Mating & Ranging Plan Sys

AMC Deployment Analysis Sys

Theater Battle Management

GCCS Common Operating Environment

Mobility Operations
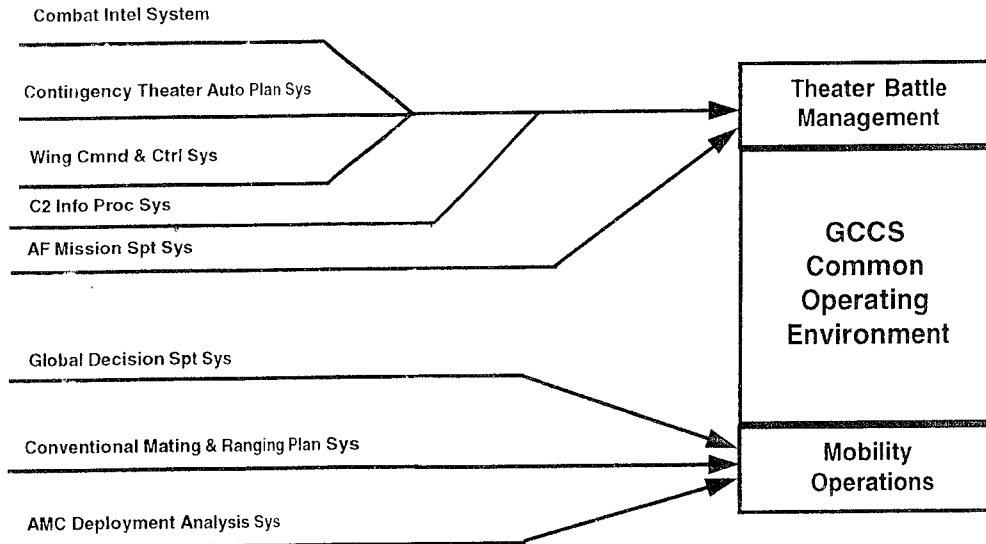
AF Global Command and Control System

USAF C2 Migration Status

- Awaiting migration systems approval
- Theater Battle Management (TBM) Request for Proposal (RFP) sent out with GCCS COE standards incorporated
- Evaluating several existing systems for crisis action/ deliberate planning requirements

Other AFGCCS Implementation Actions

- Shutdown of the Worldwide Military Command and Control System (WWMCCS)
  - Establish connectivity
  - Install hardware
  - Migrate functionality

- COE Development
  - AF responsible for 6 of 19 GCCS COE modules
  - Mid-term COE to be completed by Feb 96

AF Global Command and Control System

Relation to USAF C4I "HORIZON" Concept

- HORIZON: the overarching USAF C4I concept
  - Provides warfighter with responsive, advanced C4I systems/services
  - Supports USAF's "Global Reach, Global Power" vision
  - Encompasses several elements

- AF GCCS will reflect HORIZON's architecture management process

USAF C4I Architecture Management

- Shows enterprise-wide view of USAF C4I

- Shows information flow throughout
  - Four mission areas (Combat, Mobility, Space, Special Ops)
  - Two support areas (Intelligence and Mission Support)

- Shows key C4I nodes and intersections
  - Within Air Force, within DoD, and external to DoD

- Includes supporting diagrams, N2 charts and interoperability summary tables
  - Provides manageable set of critical C4I nodes and links
  - Provides means to identify interoperability concerns
  - Provides focus for in-depth modeling and analysis

Top-Level Air Force Architecture View

Node-to-Node (N2) Chart

Integrated Air Force C4I Systems

- Combat Operations
- Mobility Operations
- Space Operations
- Special Operations
- Intel Support
- Mission Support
- DOD & External Agencies
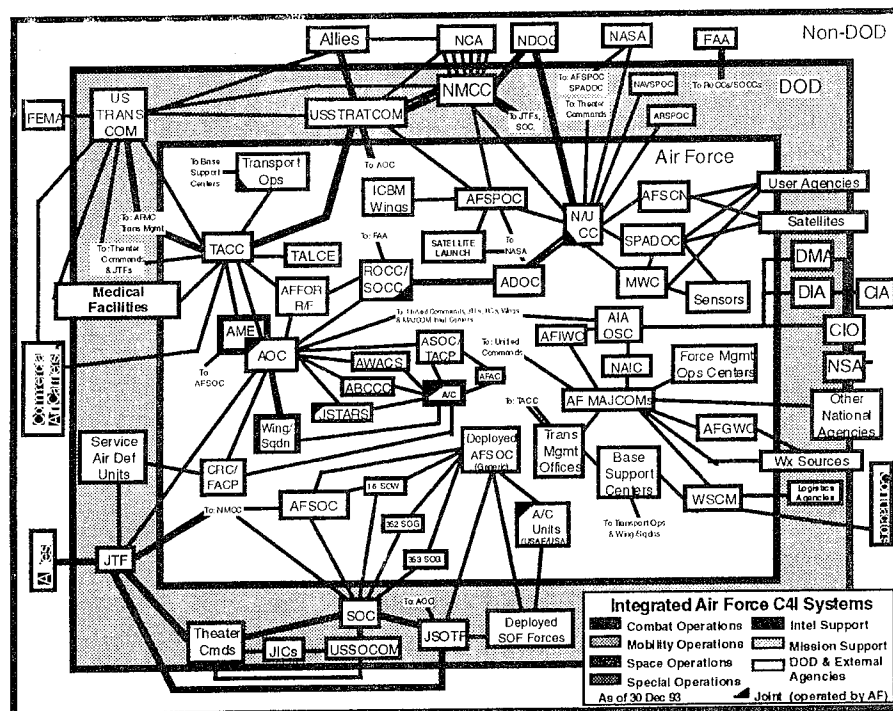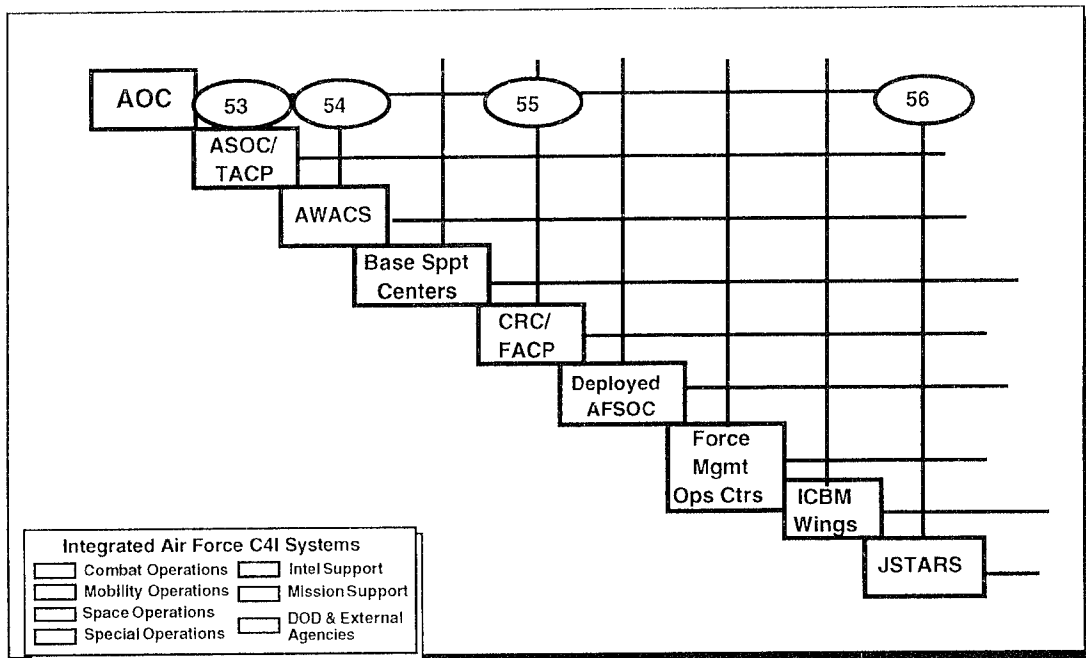
Top Level Interoperability Table

Number	Source	Destination	Mission	Information Type	Issue(s)
49a	AF ISC	NMCC	Intelligence Support		
49b	NMCC	AF ISC	Intelligence Support		
50a	AF ISC	Theater Commands	Intelligence Support		
50b	Theater Commands	AF ISC	Intelligence Support		
51a	AMF	TACC	Mobility	Movement status, Asset	Intratheater

| 53a | AOC | ASOC/TACP | Combat Operations | Tasking, Plans, Coordination | Inadequate ATO Dissemination |
| 53b | ASOC/TACP | AOC | Combat Operations | Reporting CAS Requests, Mission Result, Coordination | Inadequate Communications |

Number	Source	Destination	Mission	Information Type	Issue(s)
				Information Exchange	
53a	AOC	ASOC/TACP	Combat Operations	Tasking, Plans, Coordination	Inadequate ATO Dissemination
53b	ASOC/TACP	AOC	Combat Operations	Reporting CAS Requests, Mission Result, Coordination	Inadequate Communications
54a	AOC	AWACS	Combat Operations	ATO Dissemination, ACO Change, Warning	Inadequate ACO/ATO transfer
54b	AWACS	AOC	Combat Operations	Air Picture	None
55a	AOC	CRC/FACP	Combat Operations	Tasking, ATO Changes, Air Space Management	Inadequate ACO/ATO Transfer
55b	CRC/FACP	AOC	Combat Operations	Status, Results, Air Picture	None
56a	AOC	JSTARS	Combat Operations	Tasking, ATO Changes, Allocation	Inadequate ACO/ATO Transfer
56b	JSTARS	AOC	Combat Operations	ATM Coordination, Target/Track Data	No MTI/SAR Data Provided
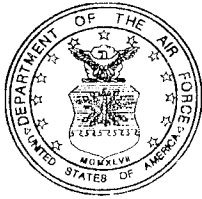
AF Global Command and Control System

SUMMARY

- USAF C2 migration started before GCCS
- USAF is full partner in GCCS implementation
- AFGCCS is manifestation of USAF HORIZON Concept

CIM-EI Symposium Panel
for
DoD Policy, Technical Standards and
Joint Interoperability Initiatives

14 December 1994

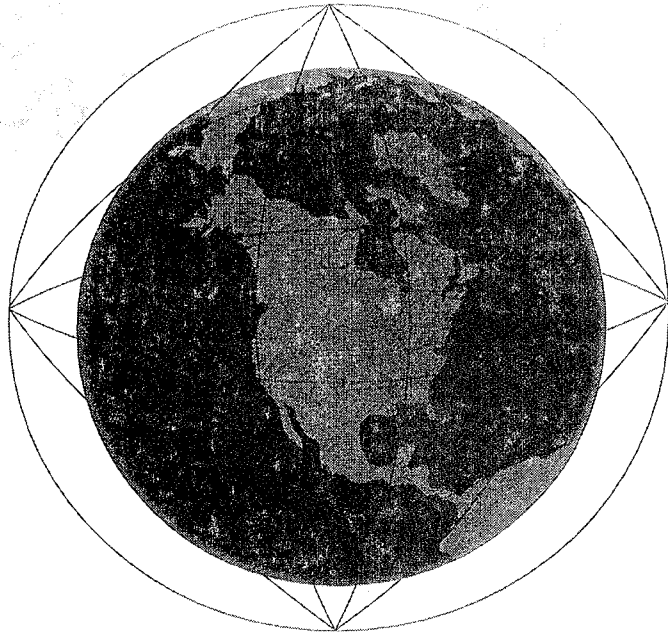## Overall Strategy to Obtain IT Products/Services Necessary for the DII/GII/NII
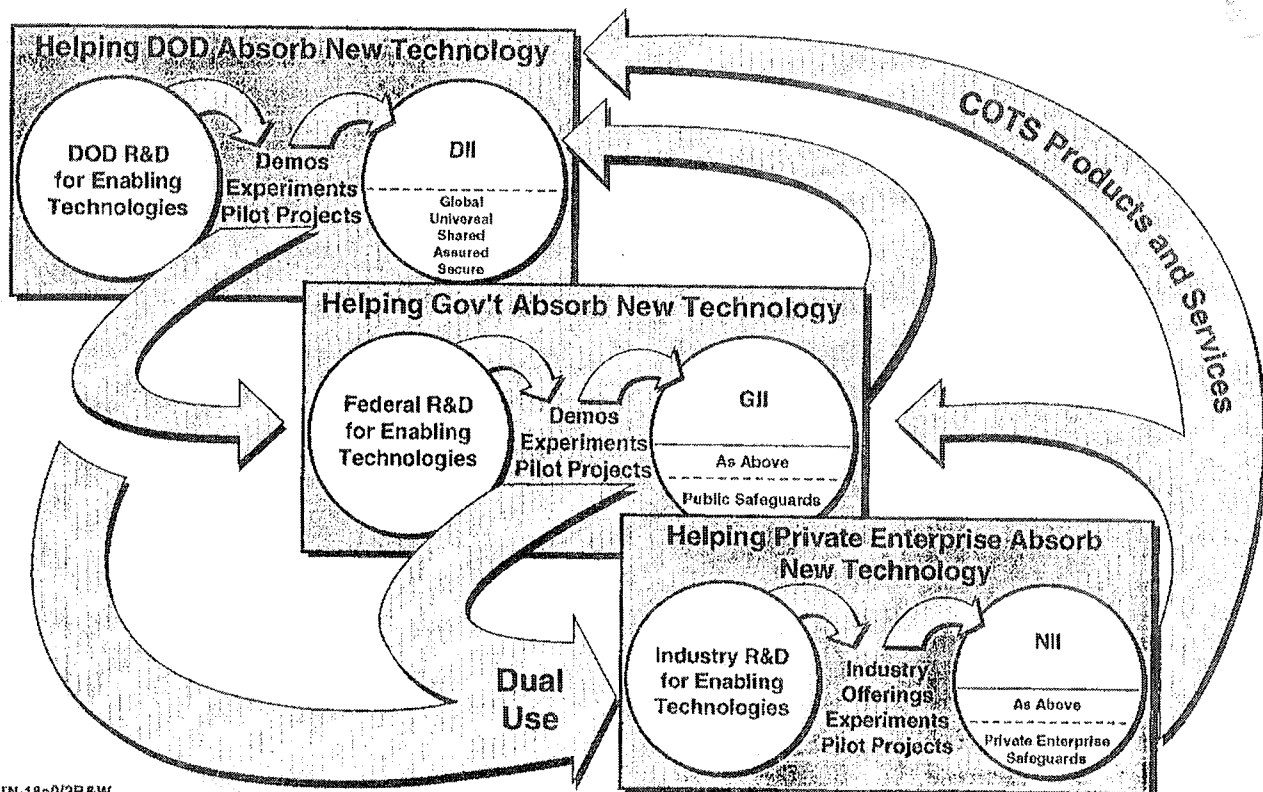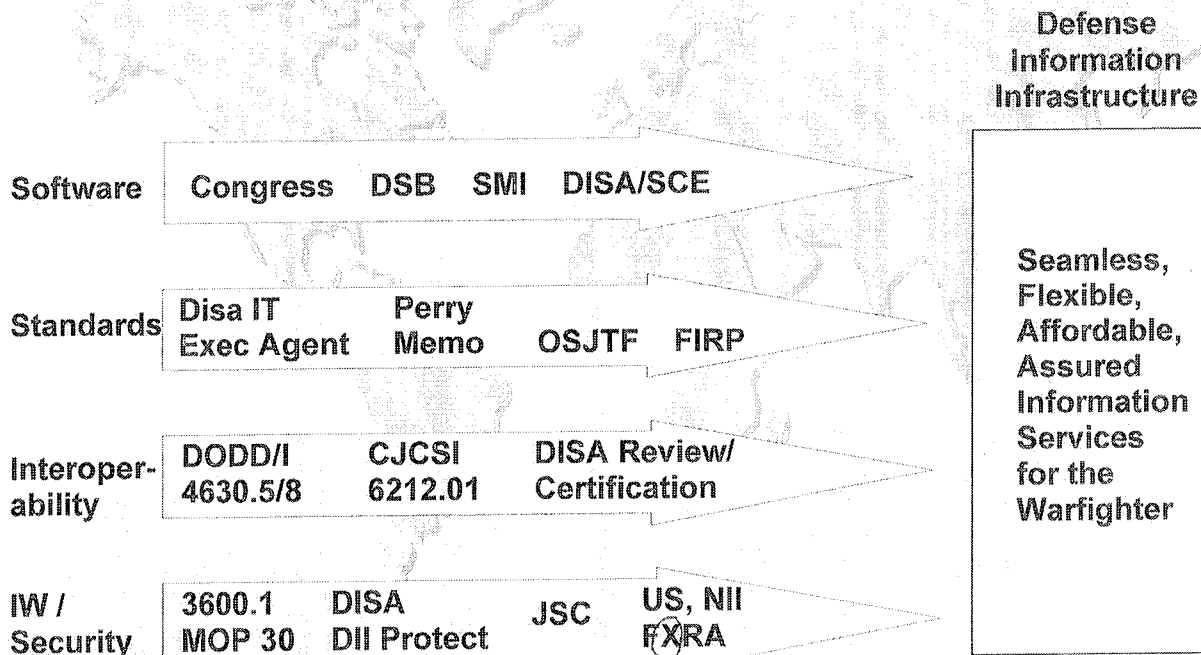
The Defense Information infrastructure

A seamless, global, secure, standards-based, end-to-end information architecture that provides

- assured
- flexible
- and affordable

information services to the warfighter.

Some Key DoD Management Thrusts

					Defense Information Infrastructure
Software	Congress	DSB	SMI	DISA/SCE	Seamless, Flexible, Affordable, Assured Information Services for the Warfighter
Standards	Disa IT Exec Agent	Perry Memo	OSJTF	FIRP	
Interoper- ability	DODD/I 4630.5/8	CJCSI 6212.01	DISA Review/ Certification		
IW / Security	3600.1 MOP 30	DISA DII Protect	JSC	US, NII FXRA	

DoD Specifications and Standards

- **Perry Memo, June 1994**
  - Commitment to performance and commercial standards

- **Kaminski Memo, November 1994**
  - "Open Systems" standards for acquisition of weapon system electronics to the greatest extent possible
  - Joint Task Force to lead standardization activity

DISA as Executive Agent for IT Standards

- **Has been moving in this direction**

- **Current standards are**
  - 99% Performance (interface)
  - 77% Commercial/Internaitonal
  - only 13% purely Military

- **Some initiatives**
  - Government Industry alliance
  - Early interoperability testing
  - Accelerated process
  - Tie into acquisition process

EA for IT Standards

GCCS
General Purpose IP
Video Teleconferencing
MultiMedia
Public Windows
Electronic Forms
Strategic Comm
DISN/Post FTS2000
Imagery
EC/EDI

TADILs
Data Elements
Symbology
MTFs
Tactical Comm
SatCom
Battlefield
 Digitization
MC&G
POSIX
ADA

OSJTF

Avionics
Radar
Fire Control
Real-time IP
etc

Elements of the DII

Cross Functional/Cross Service Integration

Enterprise Integration

C2 Apps	Intel Apps	Base/Tac Apps	Msn Spt Apps	Future Apps

Tactical Integration

Info Sec	IW	Shared Data	EC/EDI DMS	COE
Base/Tac Infra	Mega Cntrs	DII Cntl	DISN	Future Infra

Modeling & System Sim	Tech Base	Security	Standards	Test	Software Eng	Arch	Strategic Planning

Panel Members and Topics

ASD(C3I)

> Diane
> Fountaine

Federal InterNet Working
Requirements Panel

A/T

> John
> Burt

Software Initiatives

ASD(C3I)

> Barbara
> Valeri

Information Systems Security

DISA

> Belkis
> Leong-Hong

Software Center

DoD Software Management Initiatives

and

Enterprise Integration Symposium

13 - 14 December 1994

John A. Burt
Director, Test,
   Systems Engineering and Evaluation
OUSD (A&T)

DoD SOFTWARE ACQUISITION POLICIES

FIRMR

FAR

ACQUISITION/CIM POLICY
DoDD 8120.1
DoDI 8120.2

Acquisition Policy
DoDD 5000.1
DoDI 5000.2

C3I Systems

AIS   Embedded

**MISSION
NEEDS
PROCESS**

**MISSION
NEEDS
PROCESS**

**PSA (MNS)
MAISRC**

INTEROPERABILITY REQUIREMENTS
DoDD 4630.5
DoDI 4630.8

**JROC (MNS)
DAB**
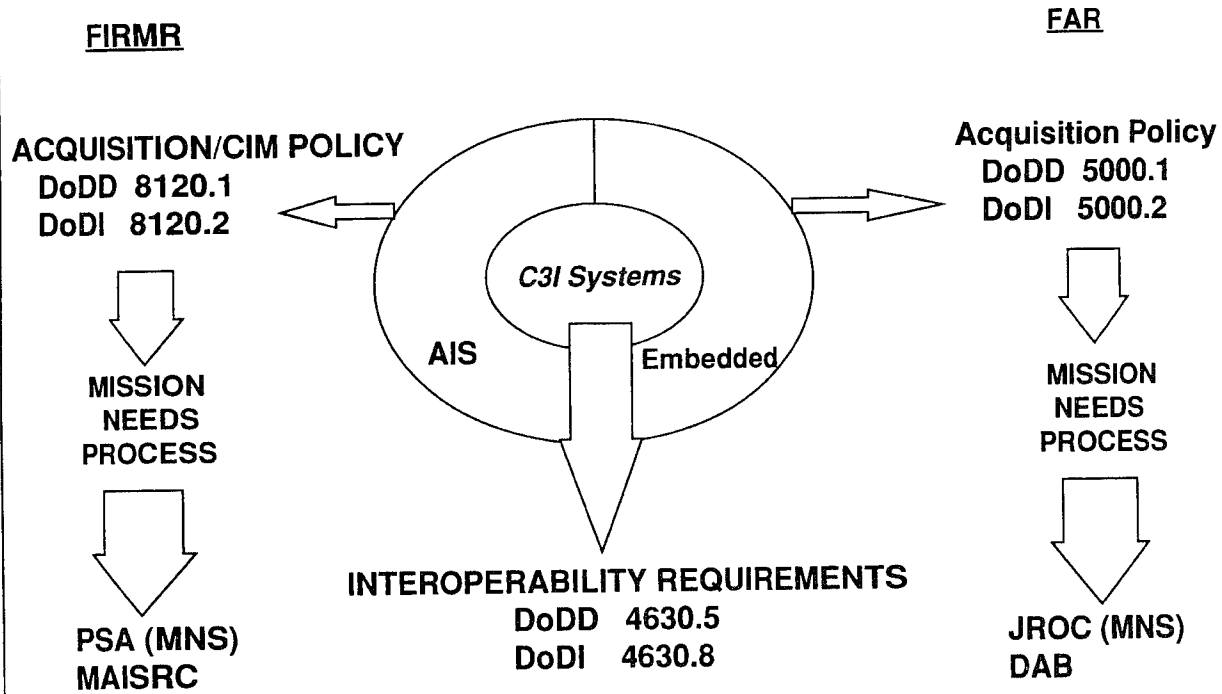
SOFTWARE MANAGEMENT INITIATIVES ORGANIZATION

```
┌─────────────────────────────────┐
│     SOFTWARE MANAGEMENT          │
│      EXECUTIVE COUNCIL           │
└─────────────────────────────────┘
          ┌──────────────────┐
          │ SOFTWARE MANAGEMENT │
          │   REVIEW BOARD      │
          └──────────────────┘
```

| SOFTWARE ACQUISITION BEST PRACTICES INITIATIVE PROCESS ACTION TEAM | SOFTWARE EDUCATION PROCESS ACTION TEAM | DSB REPORT RECOMMENDATIONS PROCESS ACTION TEAMS |
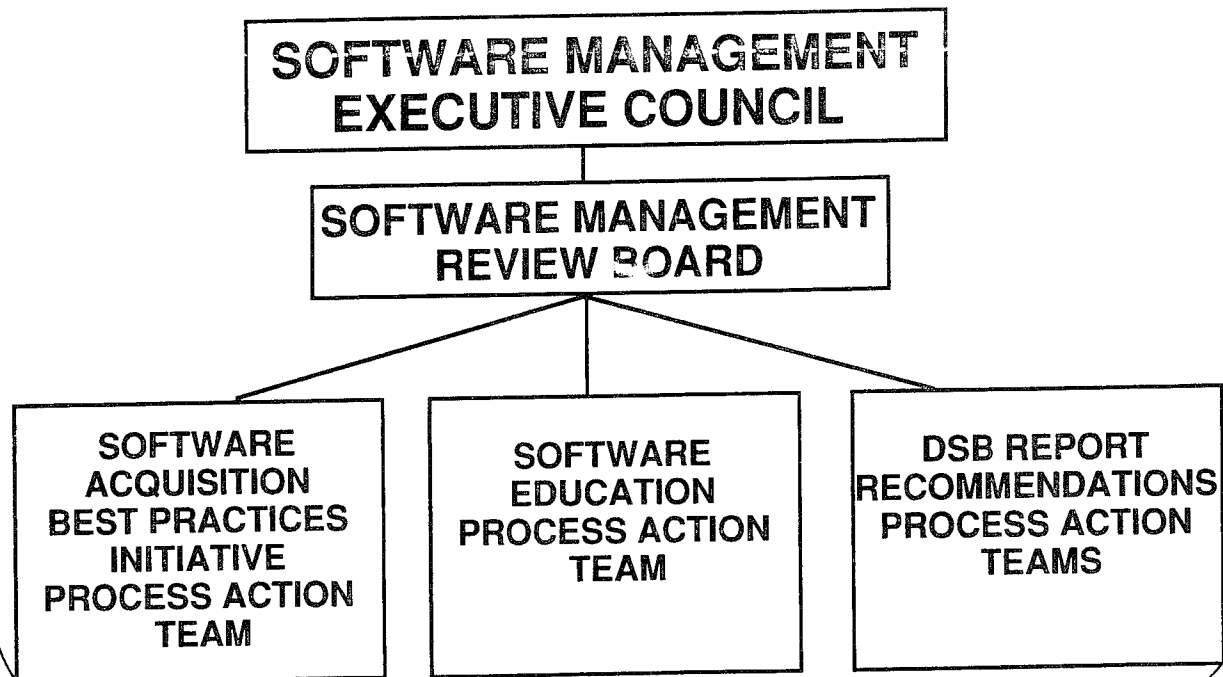
THE MISSION

- Identify "New Practices"
- Tailor and adapt best practices from other areas to software life cycle processes
- Extended the best practices to a larger scale
- Adapt "Core Concepts" of best practices to other (early) stages of the software life cycle
- Control Panel of Best Practices Initiative will identify "global" techniques
- Concurrent engineering ("Codesign", etc.)
- Controls based on quantifiable measures

SOFTWARE MANAGEMENT INITIATIVES (SMI)
OBJECTIVE FOR INTEROPERABILITY:

Provide fundamental access to data between a variety of systems.

- **Open Systems Concept**
- **The Challenge:**
  - Different machine locations, multiple software vendors, and various product vintages (legacy and emerging systems)

MIGRATION OF VINTAGE INFORMATION SYSTEMS

- **Objective:**
  - Proper correlation of common data elements among systems
- **Implementation by authorized users**
- **Revalidation of interconnections and access to data**

COMMON ACCESSIBILITY TO INFORMATION REQUIRES MORE THAN COMMON INTERFACES
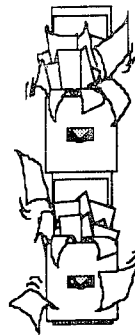
Information **System** Components

- Data
- Software Applications
- Hardware
- Computer Operating Procedures
- Information Operating Procedure
- System Operating Procedures
- Trained Personnel
- System Physical Resources
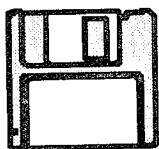
"TAILORED BRIDGES" MUST BE DEVELOPED TO PROVIDE SYSTEM ENGINEERING COMPATIBILITY
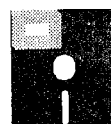
EFFECTIVE MIGRATION PATHS REQUIRE
A TWO-STEP PROCESS

LEGACY SYSTEMS

STANDARDIZED MIGRATION SYSTEMS
- Maximum Reuse
- Open System Environment
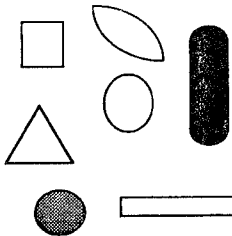
STANDARDIZATION MIGRATION PATH
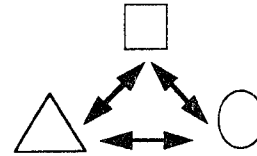
"TAILORED BRIDGES" MIGRATION PATHS
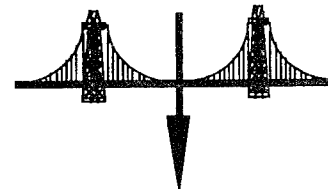
TARGET SYSTEMS
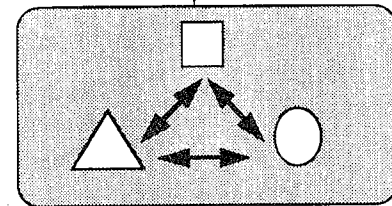
"TAILORED BRIDGES" ALLOW MULTIPLE LOCALIZED SYSTEMS TO COORDINATE AS A SINGLE SYSTEM

199
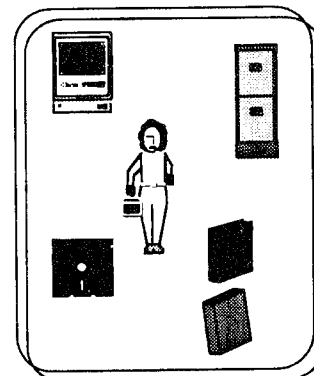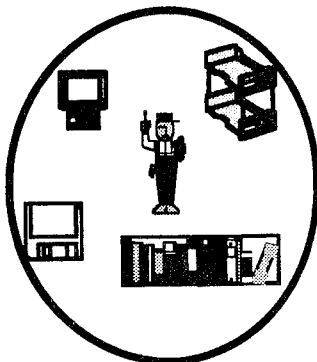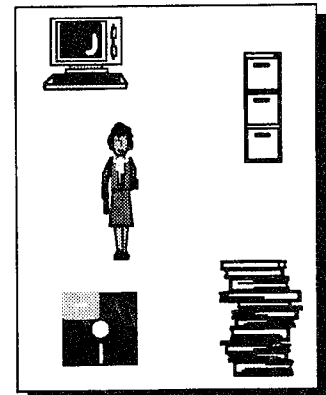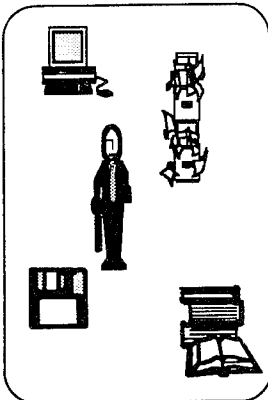
Examples of existing systems which utilize tailored bridges

- Large banks which acquire small local banks;

- International business which must conform to local customs and procedures;

- Legacy information management systems which share common data elements, but different procedures.

SOFTWARE MANAGEMENT INITIATIVES (SMI) CRITERIA
CONSOLIDATION & INTEGRATION OF DoD CIM SYSTEMS

- "Migration" systems should allow re-engineering for new technologies.
- CIM migrations must allow reuse with any new technology.
- "Migration" systems must not only standardize the interfaces and data elements, but must also standardize systems engineering elements.

    such as the underlying layer of data transfer (protocols, data handling methods, security, etc.)
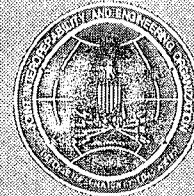
SOFTWARE CENTER OF EXCELLENCE AND DATA ADMINISTRATION

Ms. Belkis Leong-Hong
Deputy Commander

Joint Interoperability and Engineering Organization
Defense Information Systems Agency
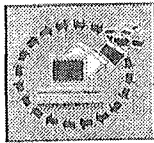
14 Dec 1994

Center for Software

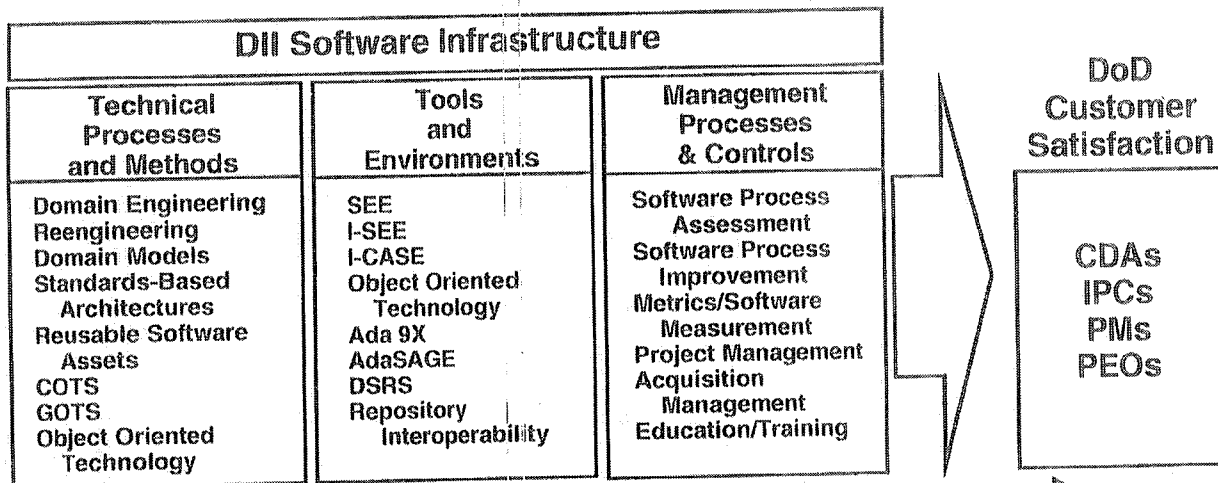OSD, MILDEP's, Agencies, Customers

C3I

CINC's, MILDEP's, OSD, DISA

Software Systems Development

Apply Best Practices, Training, Support

Analysis

Measurement

Assessment & Analysis
- Evaluation
- Metrics
- Benchmarking
- S/W Process Assessment (SPA)
- S/W Process Improvements

Products to DoD

Software to Customers

Assessments

Assessments

CINC's, MILDEP's, OSD, DISA

Assessments "Best Practices"
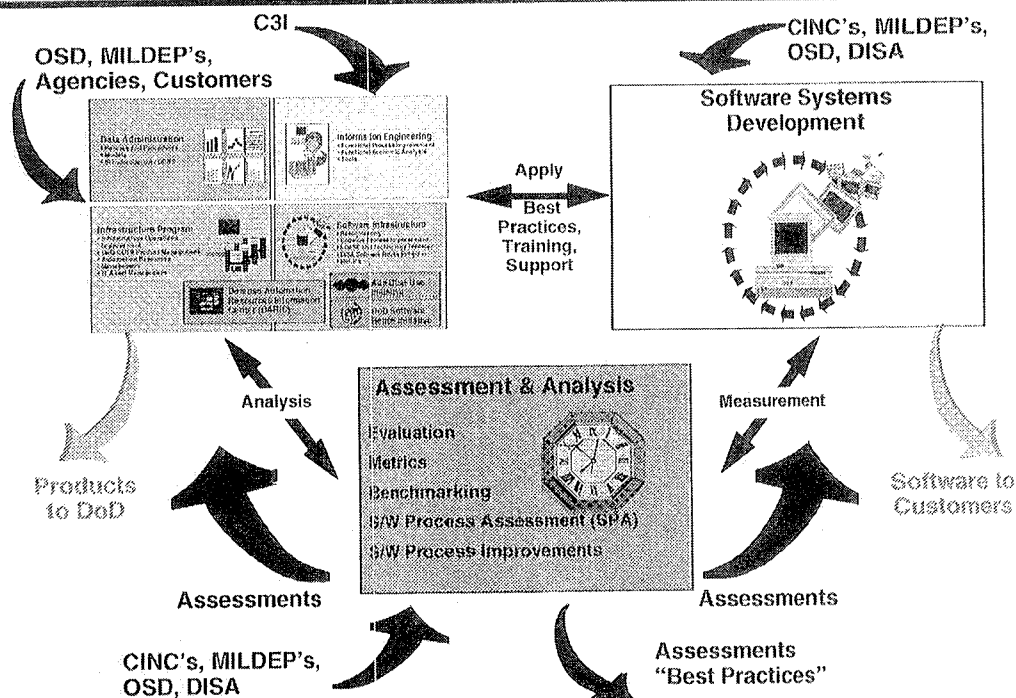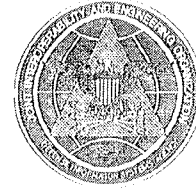
The Center for Software:

- Delivers and supports software products, practices, and processes for DoD.

- Provides software development and life cycle services for DISA information systems and DoD migration systems.

- Provides best business processes, tools, technologies, and methods in data administration, software engineering and development, business processes, DII operations, asset management, and education.
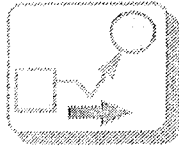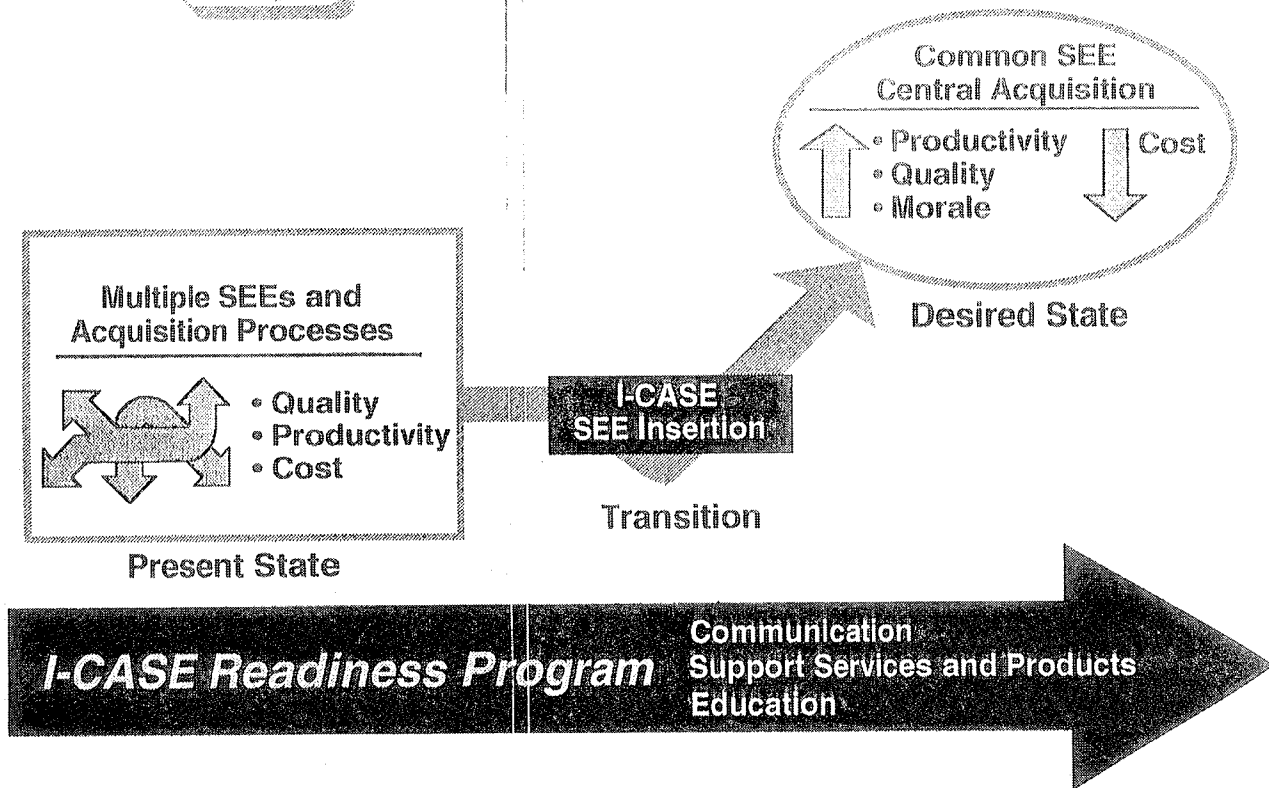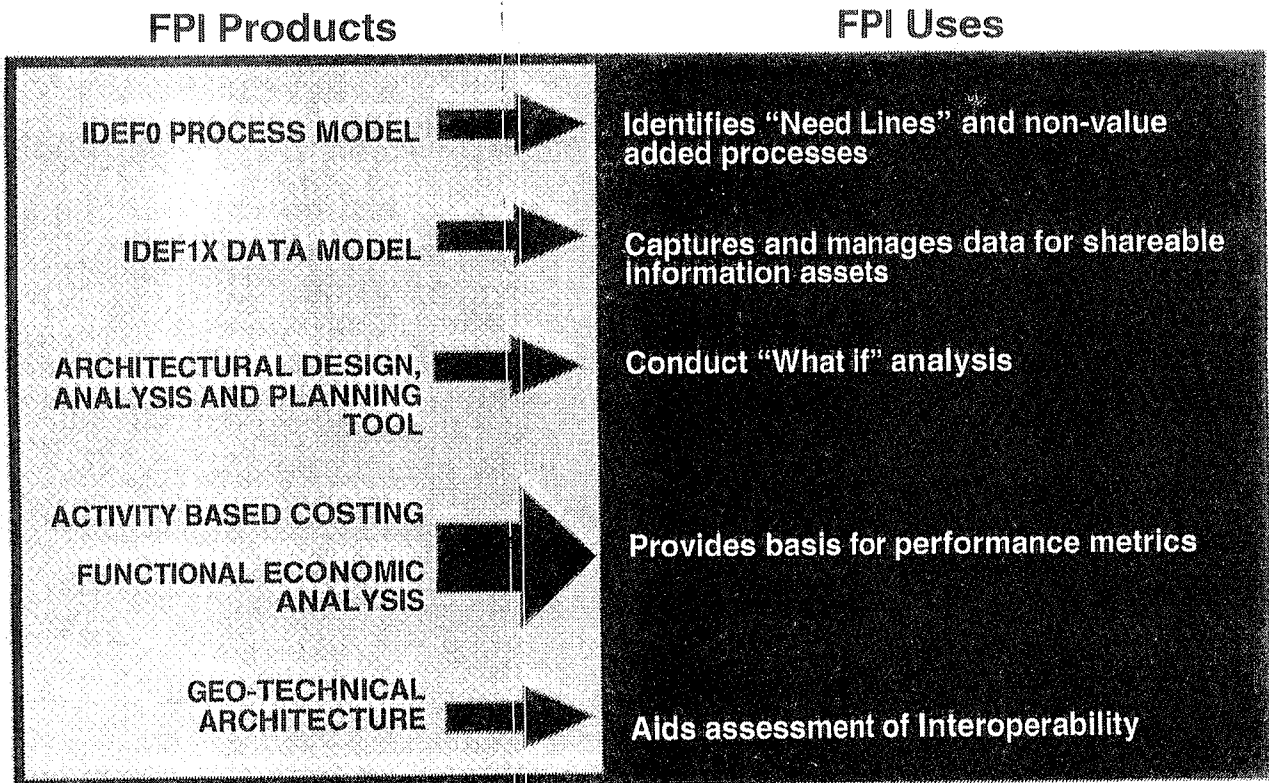
Software Systems Engineering

DII Software Infrastructure			
Technical Processes and Methods	**Tools and Environments**	**Management Processes & Controls**	**DoD Customer Satisfaction**
Domain Engineering Reengineering Domain Models Standards-Based Architectures Reusable Software Assets COTS GOTS Object Oriented Technology	SEE I-SEE I-CASE Object Oriented Technology Ada 9X AdaSAGE DSRS Repository Interoperability	Software Process Assessment Software Process Improvement Metrics/Software Measurement Project Management Acquisition Management Education/Training	CDAs IPCs PMs PEOs

Improved DoD Information Systems, Software Life Cycle Management, Customer Services & Workforce Competency

Software Infrastructure
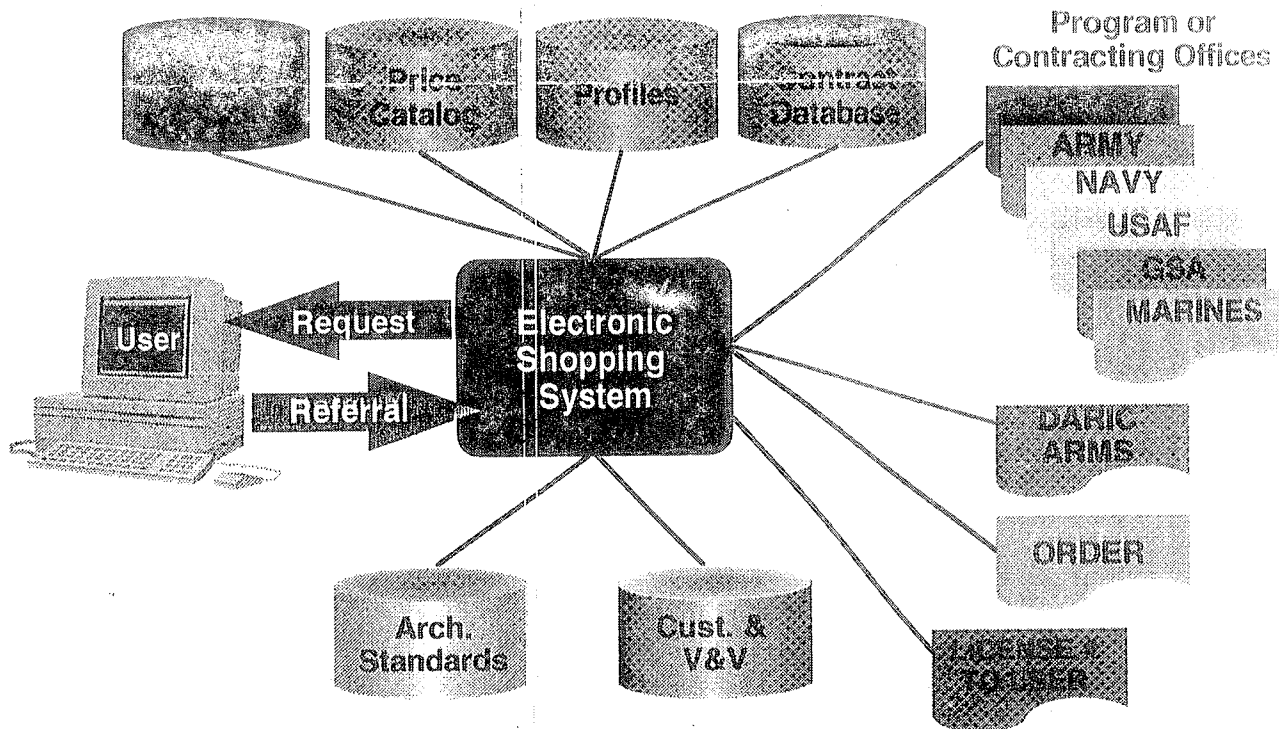## I-CASE Readiness Support Model

Common SEE Central Acquisition
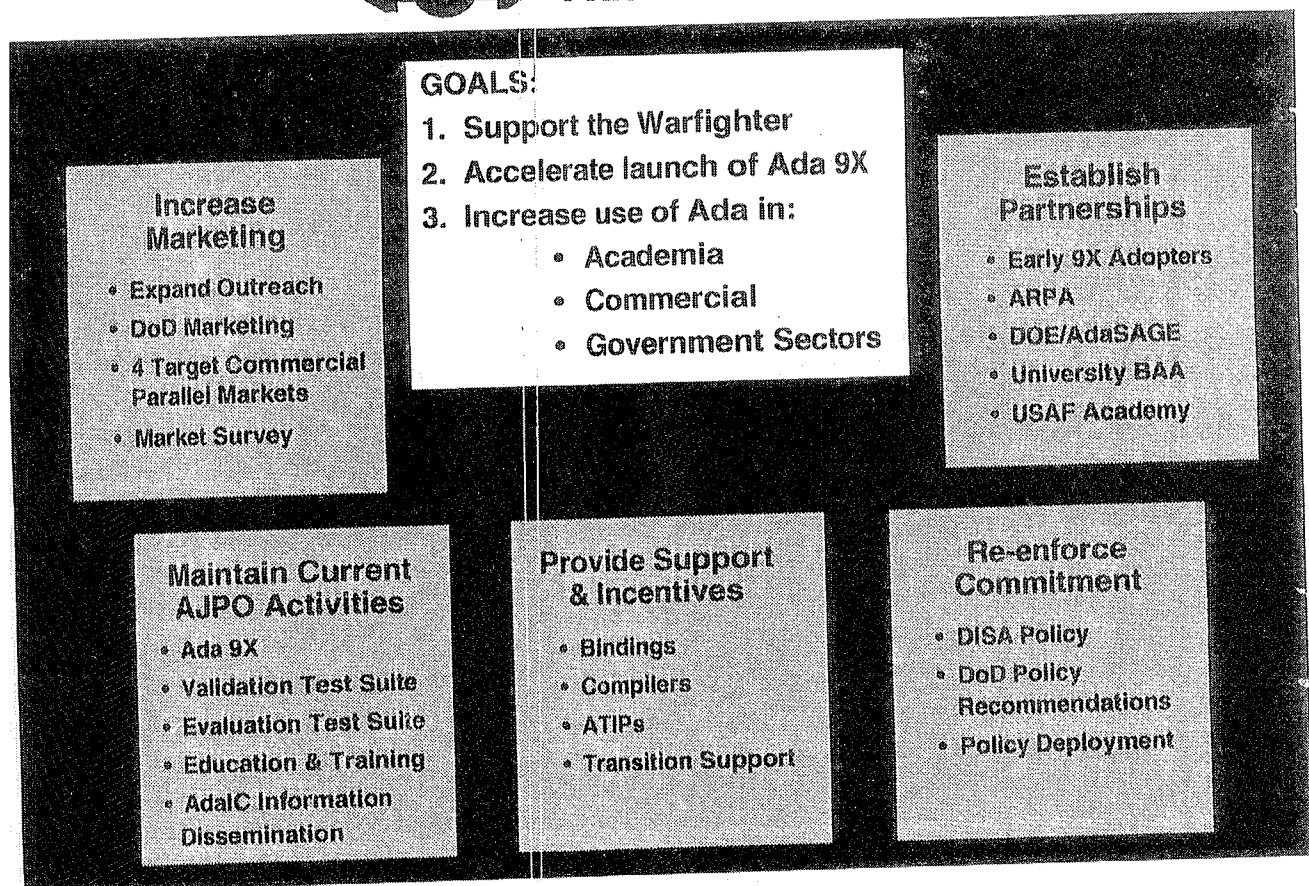
- Productivity
- Quality
- Morale

Cost

Desired State

Multiple SEEs and Acquisition Processes

- Quality
- Productivity
- Cost

I-CASE SEE Insertion

Present State

Transition

I-CASE Readiness Program

Communication
Support Services and Products
Education

FPI Products and Uses

FPI Products	FPI Uses
IDEF0 PROCESS MODEL	Identifies "Need Lines" and non-value added processes
IDEF1X DATA MODEL	Captures and manages data for shareable information assets
ARCHITECTURAL DESIGN, ANALYSIS AND PLANNING TOOL	Conduct "What if" analysis
ACTIVITY BASED COSTING / FUNCTIONAL ECONOMIC ANALYSIS	Provides basis for performance metrics
GEO-TECHNICAL ARCHITECTURE	Aids assessment of Interoperability

204

Infrastructure
IT Store – Electronic Shopping

Program or Contracting Offices

Price Catalog · Profiles · Contract Database

Electronic Shopping System

User — Request — Referral

ARMY · NAVY · USAF · GSA · MARINES

DARIC ARMS

ORDER

DEFENSE TO USER

Arch. Standards · Cust. & V&V

Ada Dual-Use

GOALS:
1. Support the Warfighter
2. Accelerate launch of Ada 9X
3. Increase use of Ada in:
   - Academia
   - Commercial
   - Government Sectors

Increase Marketing
- Expand Outreach
- DoD Marketing
- 4 Target Commercial Parallel Markets
- Market Survey

Establish Partnerships
- Early 9X Adopters
- ARPA
- DOE/AdaSAGE
- University BAA
- USAF Academy

Maintain Current AJPO Activities
- Ada 9X
- Validation Test Suite
- Evaluation Test Suite
- Education & Training
- AdaIC Information Dissemination

Provide Support & Incentives
- Bindings
- Compilers
- ATIPs
- Transition Support

Re-enforce Commitment
- DISA Policy
- DoD Policy Recommendations
- Policy Deployment

DoD Software Reuse Initiative

MISSION: Establish Reuse as Part of Systems Life-Cycle Management

GOALS: 1. Transition Reuse Technology into Mainstream
2. Develop Infrastructure
3. Effect Paradigm Shift

Manage SRI	Promote Reuse	Define/Implement Infrastructure Changes	Manage Reuse Products	Product Line Partnerships
• SRI Infrastructure Establishment • Coordinated Planning • Overall Direction • Tracking and Reporting	• Marketing • Coordination • Information Dissemination	• Organizational • Management Practices • Technical Practices • Education and Training	• Reuse Oriented Tool Sets • Reuse Library Establishment • Virtual Reuse Library • Reuse Library Population and Maintenance	• Services and Agencies • Other Govt. Agencies • Academia • Industry • Feedback and Assessment

Results: Increased software quality and reliability.; Improved management of technical risks; Reduced system development and maintenance time; and Increased productivity
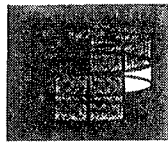
Defense Automation Resources Information Center (DARIC)

MISSION: DARIC manages a data warehouse on Information Technology assets and redistributes and promotes capacity sharing. It also manages a program to provide DOD IT assets to educational institutions and maintains an automated system to support its program areas.

Redistribution

PROGRAMS

Sharing Program

Support to Schools

Manage the Hardware Data Warehouse

- Policies and Procedures

- Models

- Standardization / DDRS

Data Integration Complexity

Same Data Requirement ....
Different Functional Needs and Different Descriptions
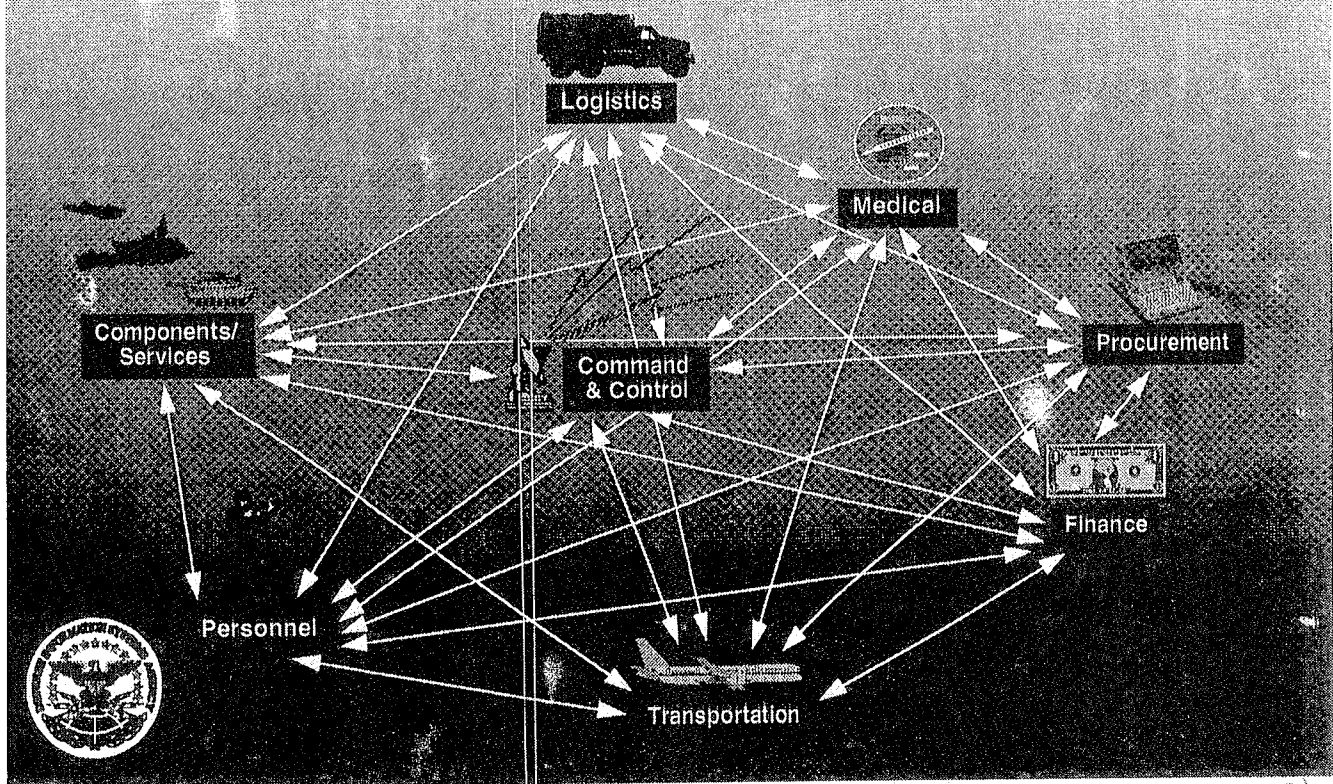
Data Administration
Interoperability Challenge
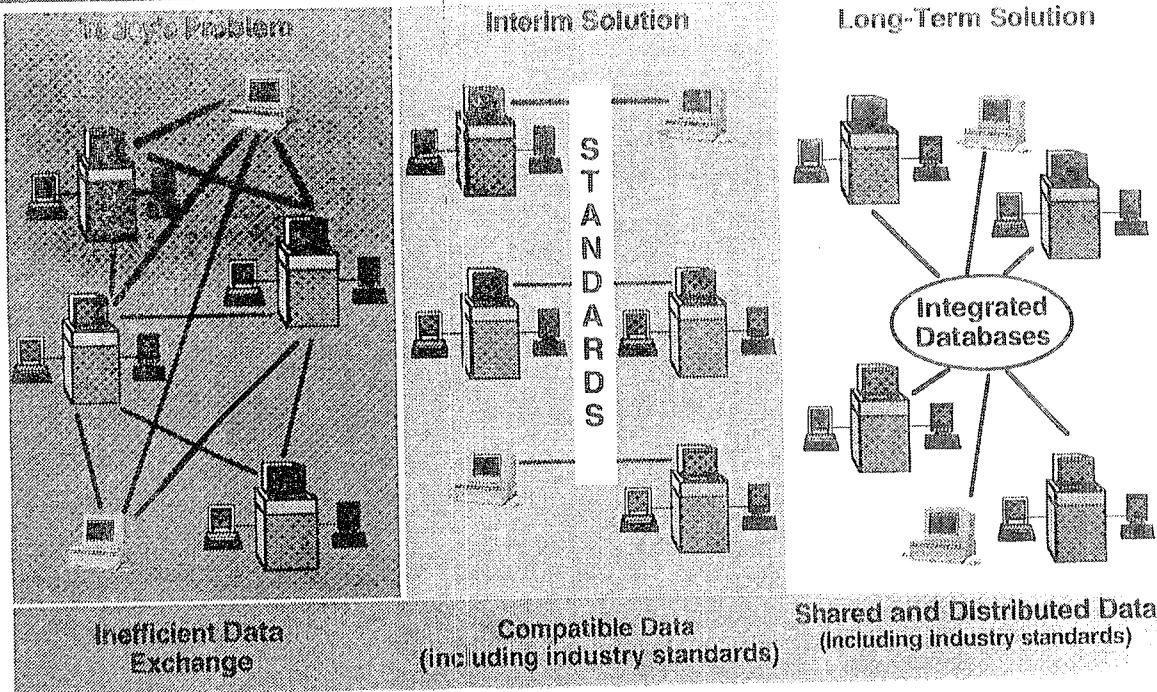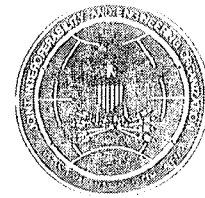
The Old Problem	Interim Solution	Long-Term Solution
Inefficient Data Exchange	Compatible Data (including industry standards)	Shared and Distributed Data (Including industry standards)

S T A N D A R D S

Integrated Databases

Data Standardization Status

JULY 1, 1994

Approved Standard Data Elements (Attributes):	529
Approved Prime Words (Data Entities):	279
Candidate Standard Data Elements (Attributes):	410
Candidate Prime Words (Entities):	77
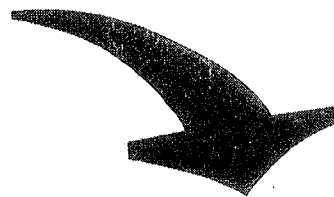
AS OF DECEMBER 7, 1994

Approved Standard Data Elements (Attributes):	1,153
Approved Prime Words (Data Entities):	362
TOTAL (Includes 19 Approved Generic Elements)	1,534
Candidate Standard Data Elements (Attributes):	715
Candidate Prime Words (Entities):	288
TOTAL	1,003

PROCESS CHANGE

DODD 8320.1 STANDARDIZATION PROCESS

Accelerate Process

FDADs = Functional Data Administrators
CDAD = Component Data Administrator
fdads = Component Level Functional Expert
DAPMO = Data Administration Program Mgmt. Office
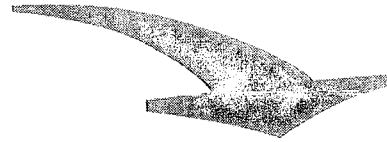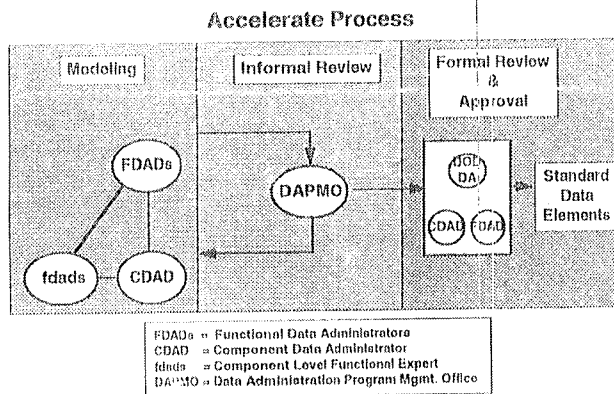
REVISED STANDARDIZATION PROCESS
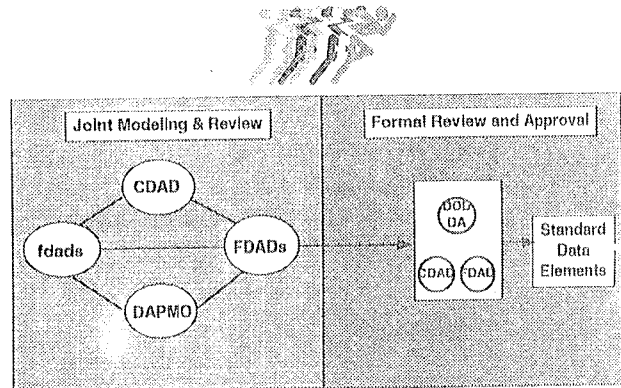
Expected Acceleration to Solve "Oscillator" Problem.
A-Priori Fixed Time

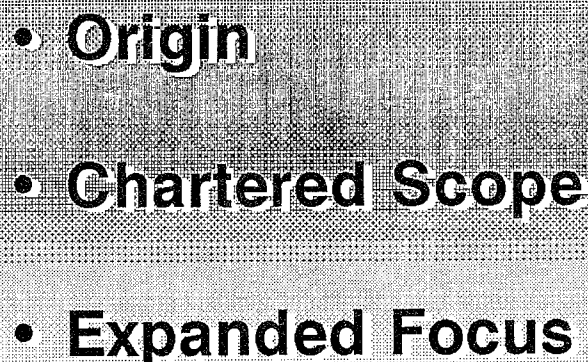# Improve Interoperability, Flexibility, Agility, and Capability of C2 Systems
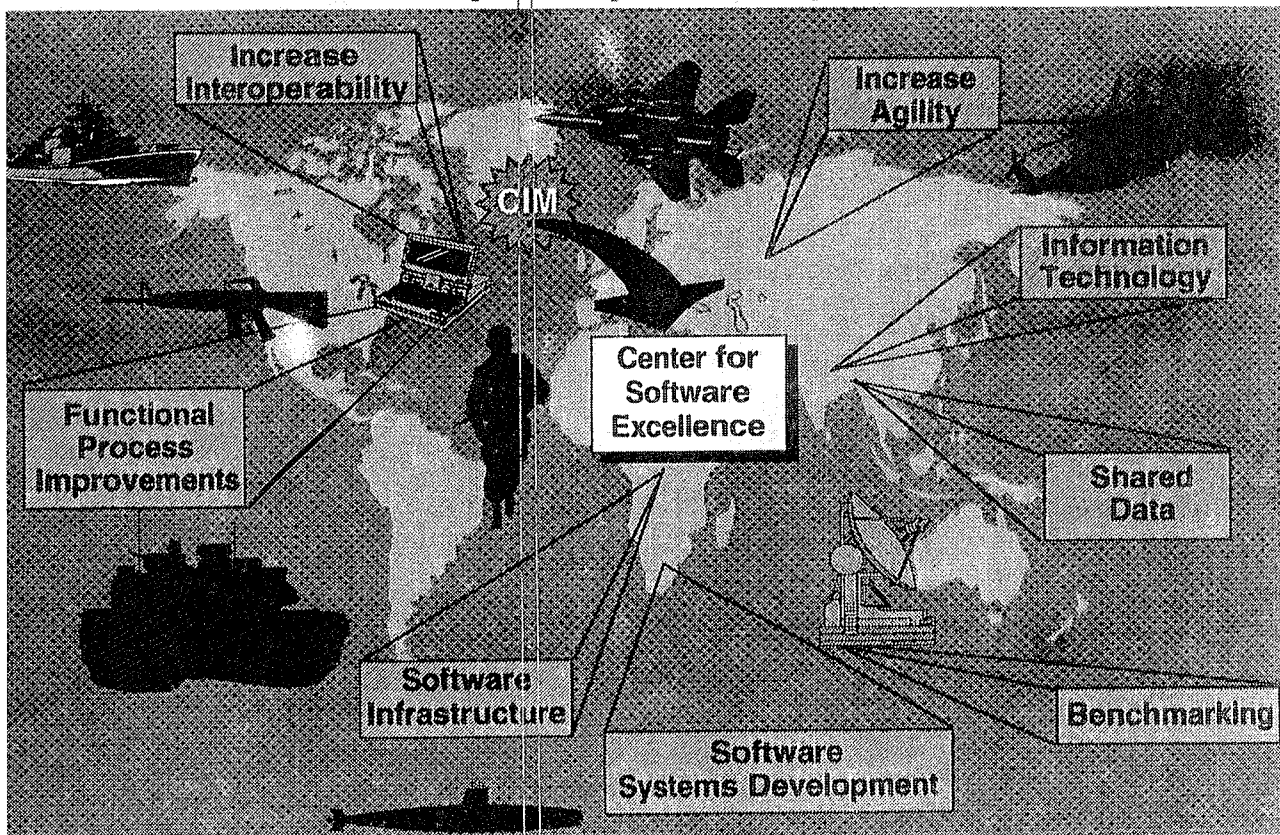
DRAFT REPORT RECOMMENDATIONS

Three Major Targets:

- Increased Integration Across Federal Agency Internetworking Activities

- Policy & Technology Assessments Refocused Toward More Integrated & Rapidly Evolving Technology

- Operational Support Better Defined & Formalized

BACKGROUND

Federal Internetworking Requirements Panel (FIRP)

- Origin

- Chartered Scope

- Expanded Focus

GOALS OF STANDARDS

- **FULFILLING FEDERAL MISSION NEEDS**
- **ENABLING INTEROPERABILITY**
- **PROVIDING FOR SOFTWARE & HARDWARE PORTABILITY**
- **LOWERING COST**

HIERARCHY OF STANDARDS

- **INTERNATIONAL VOLUNTARY**
- **NATIONAL &/OR CONSORTIA**
- **DE FACTO/MARKETPLACE**

SELECTION OF STANDARDS INFLUENCED BY:

- *TECHNICAL*
- *MARKETPLACE*
- *STATUS AS A STANDARD*

DOMINANT PRECEPTS

- **Rapid Evolution Of Technology**

- **Evolving Infrastructure**

    Bleeding ——▶ Leading ——▶ Core

- **Affinity Groups**

SECURITY CHALLENGES

◆ RAPID PACE OF TECHNOLOGY

◆ DEMAND FOR GLOBAL CONNECTIVITY AND INTEROPERABILITY

◆ INCREASED RELIANCE ON COMMERCIAL PRODUCTS AND
SERVICES

◆ NEED FOR EXPANDED SET OF SECURITY SERVICES

THE VISION - A SECURE DII

◆ ALL DOD ENTERPRISES CONNECTED TO, BUT PROTECTED
FROM, THE GLOBAL INFORMATION NETWORK

◆ ALL DII TRANSACTIONS ACROSS THE GLOBAL INFORMATION
NETWORK SECURED

◆ POSITIVE IDENTIFICATION AND AUTHENTICATION OF ALL
INFORMATION ACCESS WITHIN THE DII

◆ GUARANTEED AVAILABILITY OF CONNECTIVITY TO SUPPORT
CRITICAL FUNCTIONS VIA THE GLOBAL INFORMATION
NETWORK

CONVERGENCE OF DII SECURITY

FINANCE
INTELLIGENCE
HEALTH ADMIN
LOGISTICS
COMMAND &
CONTROL

FUNCTIONS

GLOBAL SECURITY
ACROSS DII

COMMON SECURITY
SOLUTION

DMS   GCCS
DISN
ITSDN
MEGA DATA CENTERS

E-MAIL
APPLICATIONS   EDI/EC
FILE
TRANSFER
INFO SEARCH
& RETRIEVAL
REMOTE DATA
BASE ACCESS

MAJOR PROGRAM
INITIATIVES
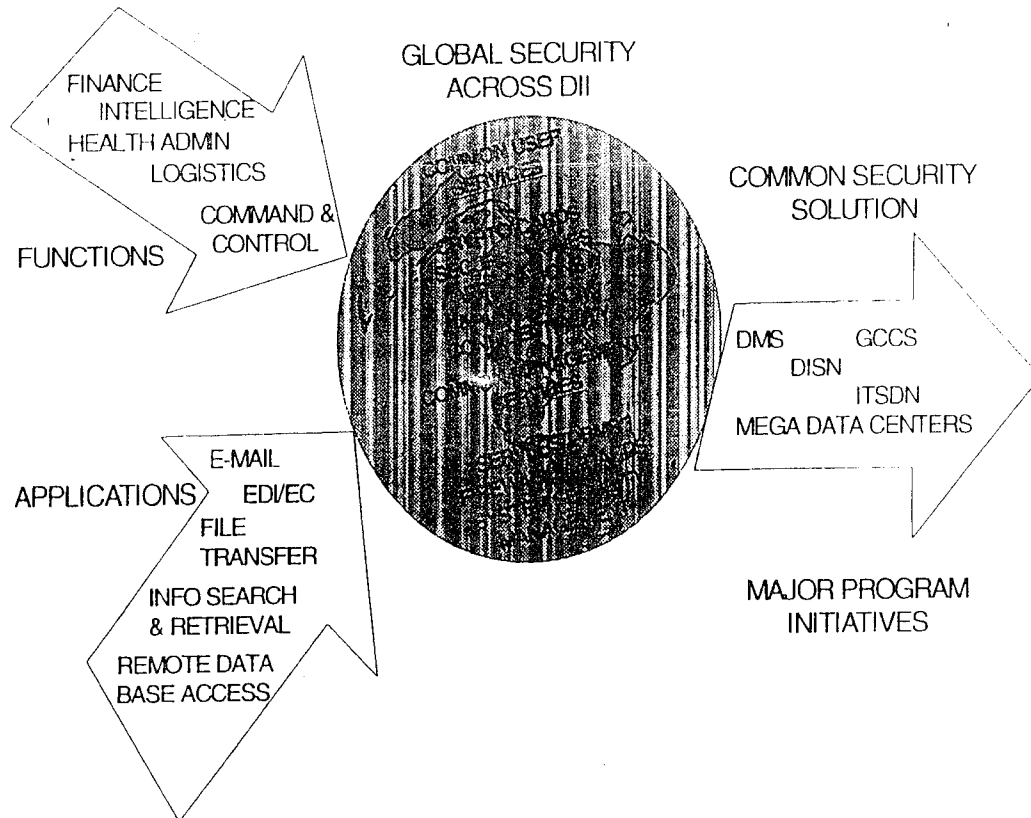
The Department of Defense
Corporate Information Management
and
Enterprise Integration
Symposium
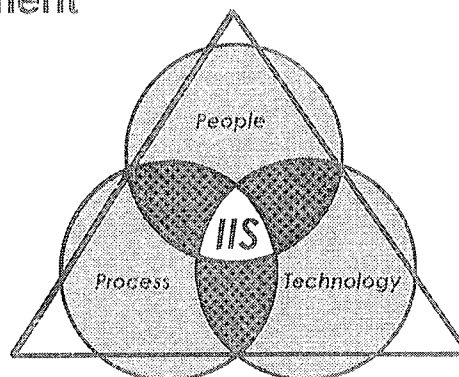
Building a stronger team

J. R. Cleveland
December 14, 1994

Eicher/941214/?/1

Martin Marietta Corporation

Largest Aerospace/Electronics Corporation in the World

- *Sales ~ $10 Billion, Employees ~ 96,000 ....Operations in 37 States in the U.S. and 17 Other Countries*

- *Designs, Develops and Manufactures Electronics, Software, and Provides Services for U.S. and Foreign Governments and Industry, Including Commercial Customers*

- *Operates Six Facilities for the U.S. Department of Energy in Addition to Sandia National Laboratories*

- *Third Largest Supplier of Aggregates in the U.S.*

- *Product Applications from Depths of the Oceans to the Far Reaches of Space*

> *Number 51 on the 1993 Fortune 500 List of Largest Industrial Corporations in the United States*
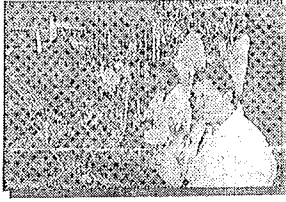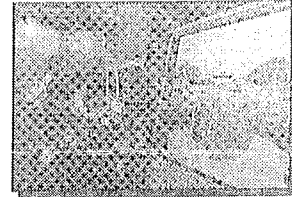
M94PHW00850/02
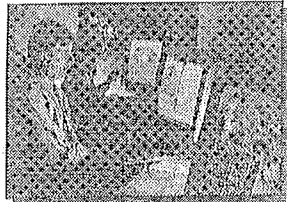
Martin Marietta Corporation
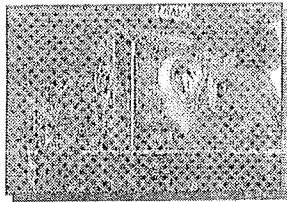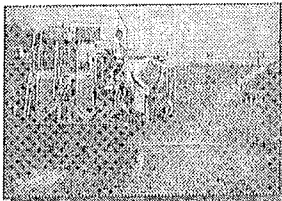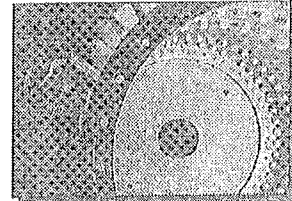
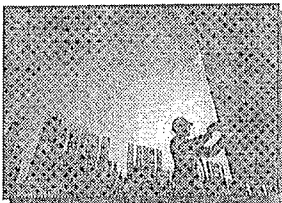**Electronics Group**

Space Group

Information Group

Services Group

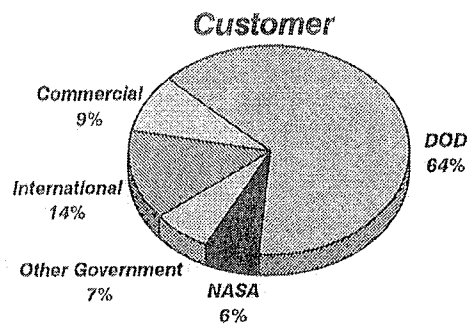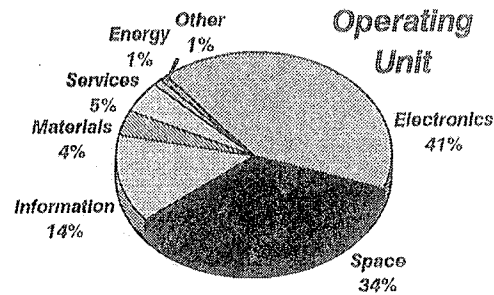**Martin Marietta Materials, Inc.**

Energy Group

Sandia Corporation

Martin Marietta 1993 Sales

Customer

- Commercial 9%
- International 14%
- Other Government 7%
- NASA 6%
- DOD 64%

Total Sales = $10,424M

Operating Unit

- Other 1%
- Energy 1%
- Services 5%
- Materials 4%
- Information 14%
- Electronics 41%
- Space 34%

Total Sales = $10,424M

Market Segment

- Other 4%
- Space Launch 18%
- Services 5%
- Materials 4%
- Spacecraft 16%
- Information 17%
- Avionics & Fire Control 26%
- Weapons 10%
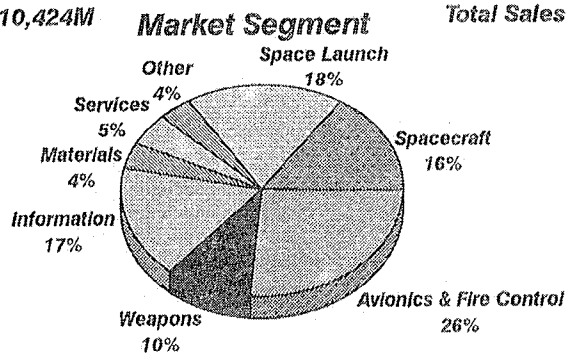
Total Sales = $10,424M

M94PHW00850/09

219

Martin Marietta Corporation

Major Locations in the U.S.

Map of the United States showing major locations:
- Burlington, VT
- Utica, NY
- Syracuse, NY
- Schenectady, NY
- Binghamton, NY
- Pittsfield, MA
- Valley Forge, PA
- East Windsor, NJ
- Cherry Hill, NJ
- Baltimore, MD
- Moorestown, NJ
- Bethesda, MD
- Camden, NJ
- Livermore, CA
- Denver, CO
- Portsmouth, OH
- Reston, VA
- Vandenberg AFB
- Paducah, KY
- Raleigh, NC
- Milan, TN
- Oak Ridge, TN
- Albuquerque, NM
- Atlanta, GA
- San Diego, CA
- Orlando, FL
- Cape Canaveral, FL
- New Orleans, LA
- Largo, FL

M94PHW00850A/02

The challenge for IIS

Internal Information Systems

External Business Drivers
- Shrinking defense market
- Industry consolidation
- Changing customer needs

Internal Business Drivers
- Merger activity
- Synergies:
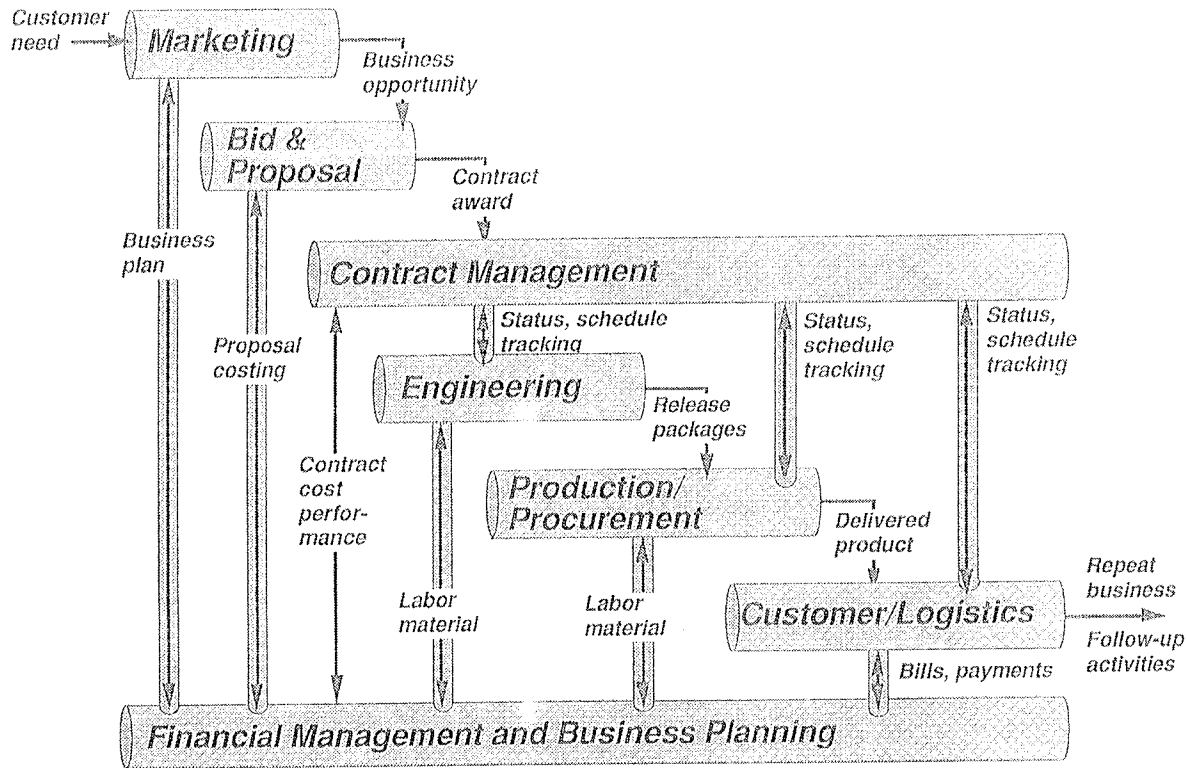 1+1=1-1/2 (cost)
  1+1=3 (sales)
- Adjacent markets

Demand systems with:
- ✓ Faster delivery
- ✓ Adaptability to meet changing business requirements
- ✓ Lower costs
- ✓ Reliability
- ✓ Security
- ✓ Enable business re-engineering and provide a strategic competitive advantage

Simple Driver: Make The Business Successful

Eicher/941214/*/1

Customer need → Marketing → Business opportunity

Bid & Proposal → Contract award

Contract Management

Business plan

Proposal costing

Contract cost performance

Status, schedule tracking — Engineering — Release packages

Status, schedule tracking | Status, schedule tracking

Production/Procurement → Delivered product

Labor material | Labor material

Customer/Logistics → Repeat business / Follow-up activities

Bills, payments

Financial Management and Business Planning

CEOForum/930921/*/7

Mission

Internal Information Systems

Provide **low cost, high quality** information services to the business groups we serve.
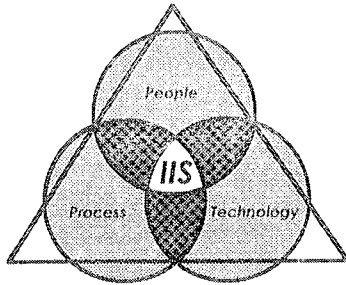
Leverage opportunities for **common processes** and **systems** with a focus on **solving business problems** and **improving customer profitability.**

Business leverage

Data Processing Utility
(Host and Infrastructure)

Organizational Functional Support
(Financial Reporting)

Cross-Functional Information
(Material Management)

Business Decisions Enabler
Shareholder Value

Customer's Information Management "food chain"

| Improve efficiency and effectiveness | Rationalize existing application portfolios | Utilize process re-engineering | Align IT investments with business objectives |

Critical Success Factors

LM-Cleveland/941129/*/12

Obstruction analysis

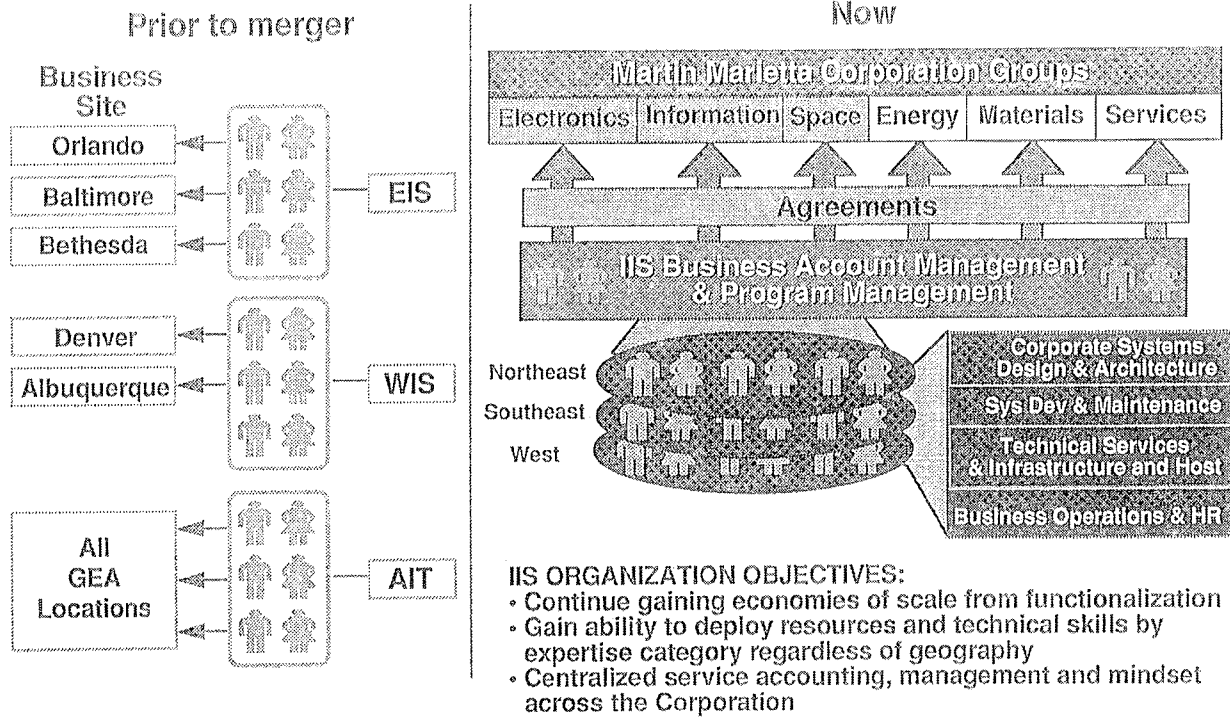## Obstruction analysis:

	User/Customer	IIS
People	• Change-adverse • Skeptical	◦ Lack of common vision ◦ Focus on system vs. value-added information ◦ Competition vs. corporation
Process	• Functional vs. process • Turf battles	◦ Strong geographic boundaries ◦ Disparate mainframe legacy systems
Technology	• Mainframe Center moving to distributed Unix	◦ Multiple approaches to client/server and OO tools

Eichor/941214/73
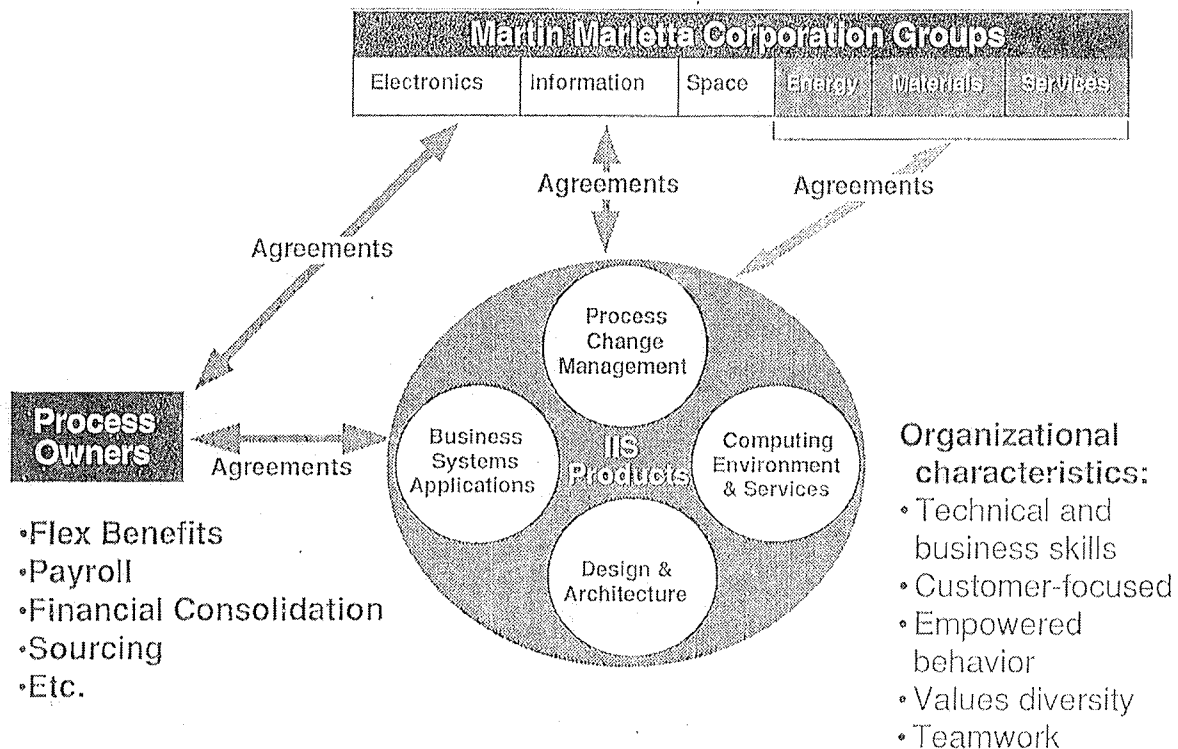

People

Operational Concept

Prior to merger

Business Site

Orlando
Baltimore
Bethesda
→ EIS

Denver
Albuquerque
→ WIS

All GEA Locations
→ AIT

Now

Martin Marietta Corporation Groups

| Electronics | Information | Space | Energy | Materials | Services |

Agreements

IIS Business Account Management & Program Management

Northeast
Southeast
West

- Corporate Systems Design & Architecture
- Sys Dev & Maintenance
- Technical Services & Infrastructure and Host
- Business Operations & HR

IIS ORGANIZATION OBJECTIVES:
- Continue gaining economies of scale from functionalization
- Gain ability to deploy resources and technical skills by expertise category regardless of geography
- Centralized service accounting, management and mindset across the Corporation

LM-Cleveland/941129/*/22

"Virtual Expertise" organizational concept

Martin Marietta Corporation Groups

| Electronics | Information | Space | Energy | Materials | Services |

Agreements   Agreements

Agreements

Process Owners

Agreements

- Flex Benefits
- Payroll
- Financial Consolidation
- Sourcing
- Etc.

IIS Products:
- Process Change Management
- Business Systems Applications
- Computing Environment & Services
- Design & Architecture

Organizational characteristics:
- Technical and business skills
- Customer-focused
- Empowered behavior
- Values diversity
- Teamwork

LM-Cleveland/941129/*/5

223

IIS — 1500 people in 3 regions
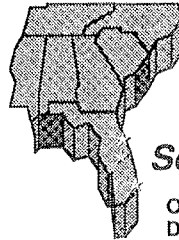
Western Region

Denver, CO
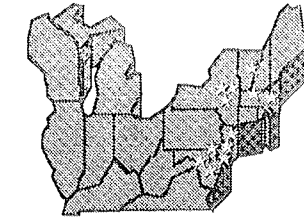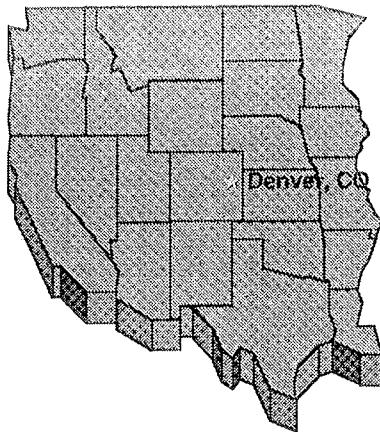
Northeast Region

Valley Forge, PA
Utica, NY
Syracuse, NY
Binghamton, NY
Baltimore, MD
Bethesda, MD
E. Windsor, NJ
Moorestown, NJ
Camden, NJ
Pittsfield, MA
Washington, D.C.
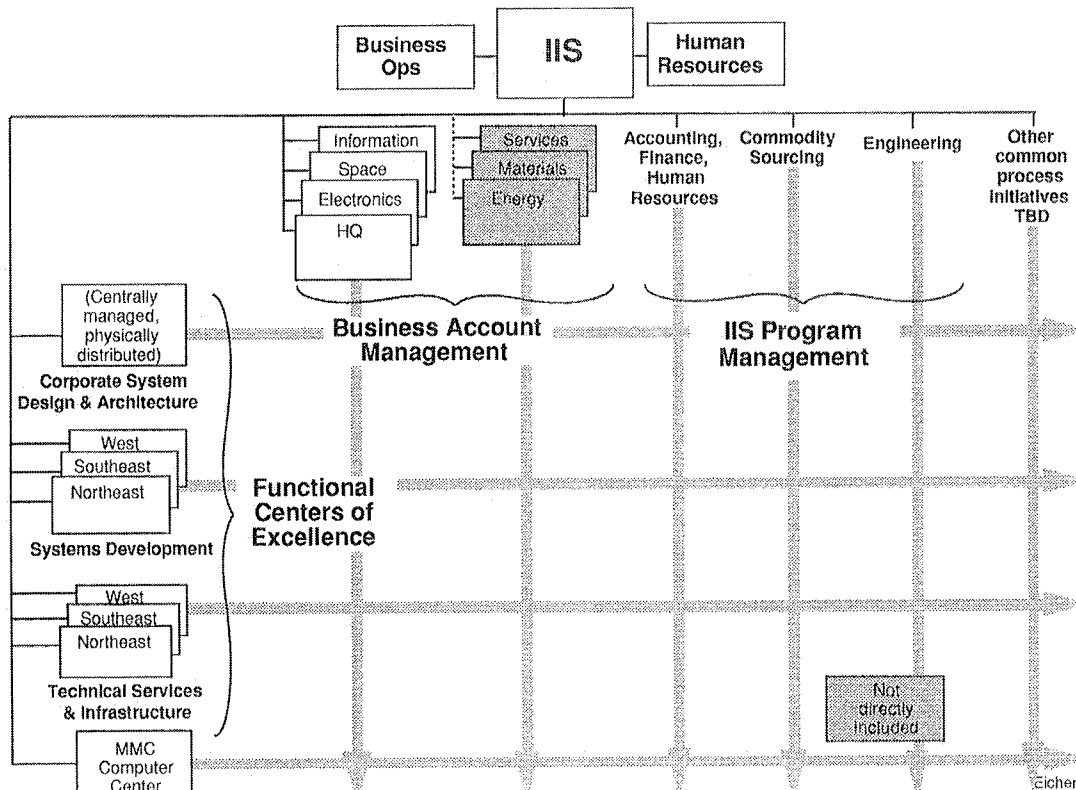Burlington, VT

Southeast Region

Orlando, FL
Daytona Beach, FL
Lakeland, FL

MISSION: Be the provider for internal information technology solutions

Eicher/941214/*/5
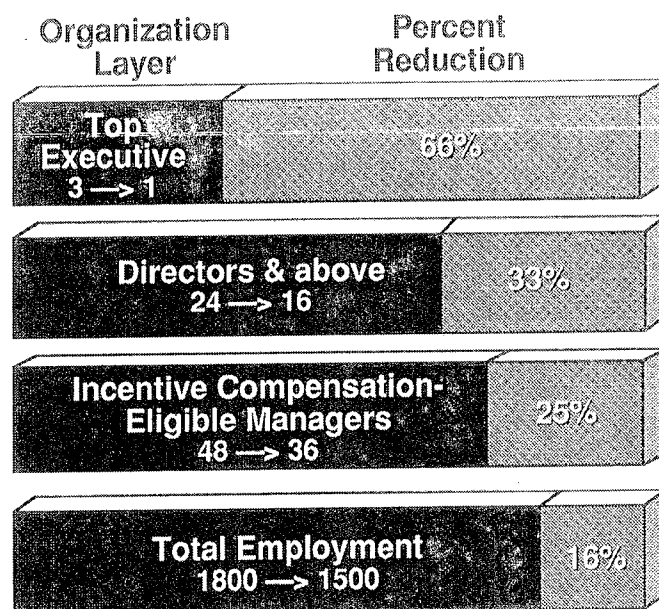
IIS organizational concept — customer focused, market driven

| Business Ops | IIS | Human Resources |

Information
Space
Electronics
HQ

Services
Materials
Energy

Accounting, Finance, Human Resources

Commodity Sourcing

Engineering

Other common process initiatives TBD

(Centrally managed, physically distributed)

Corporate System Design & Architecture

West
Southeast
Northeast

Systems Development

West
Southeast
Northeast

Technical Services & Infrastructure

MMC Computer Center

Functional Centers of Excellence

Business Account Management

IIS Program Management

Not directly included

Eicher/941214/*/10

224

Organization Layer	Percent Reduction
Top Executive 3 —> 1	66%
Directors & above 24 —> 16	33%
Incentive Compensation-Eligible Managers 48 —> 36	25%
Total Employment 1800 —> 1500	16%

A flatter, more empowered organization

Eicher/941214/*/6
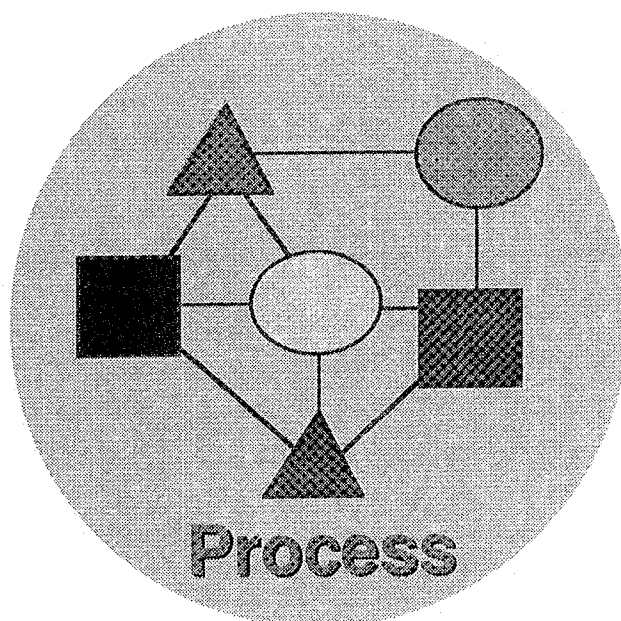
Process

The process is the real game ... new paradigm

Example

Recruiting Compensation Delivery Benefits Delivery Personnel Management Communi-cation

Human Resource Management Process

Old paradigm
(Computer Systems Focus)

Computer system ☐
No common approach ▨
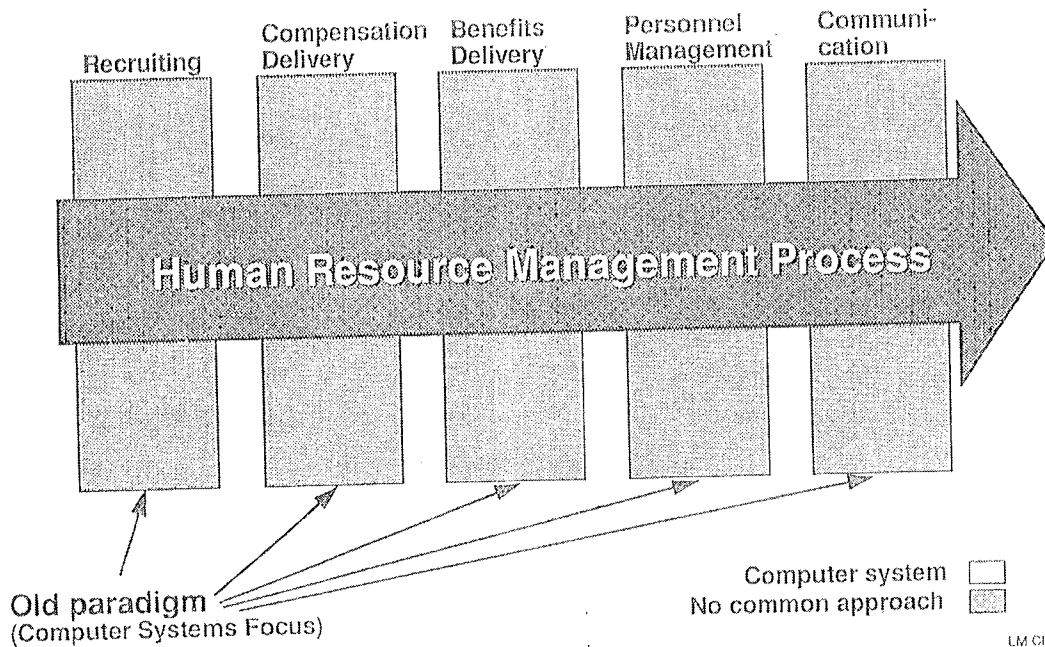
LM Cleveland/941129/*/17

Generic Strategy for Enterprise Systems

Preferred application/process

Corporate Applicability

Group Synergies

Local Focus

% potential commonality

PSP
Payroll
Accounts Payable
Corporate Treasury
General Ledger
Travel & Living
EDI Services
HR/Personnel
Purchasing   CAD/CAM
Salary Planning   MRP
Environmental   Order/Requisition
 Health & Safety   Material Cost Est.   Marketing
Insurance   Cost Management   Proposal Support
Pension   Shop Floor Control   Contract Management

Internal   External

Customer

*As process moves closer to external customer,
opportunity for commonality decreases*

941214/*/12

226

1) Meets standards, architecture, performance; candidate for preferred system	3) Integral to existing business process — candidate for technology insertion
2) Meets individual user requirements, but less than Category 1	4) Lacks standards — old technology, high cost, will be replaced

Eicher/941214/*/13

Technology

227
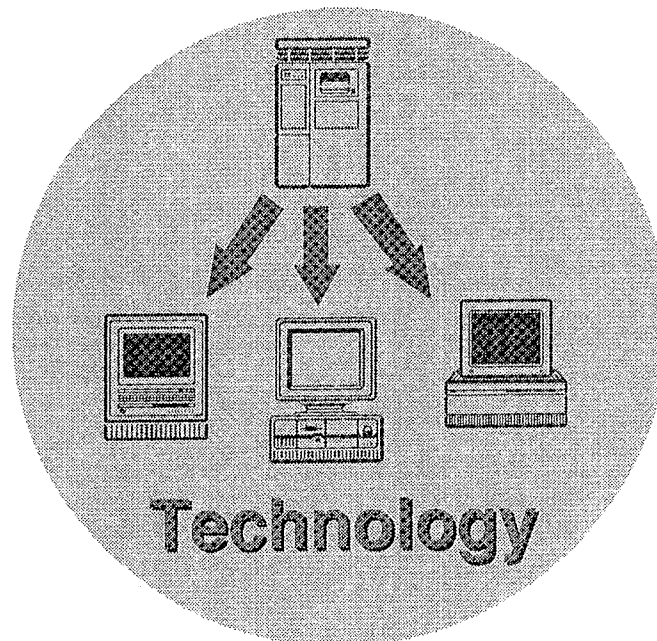
Strategy for MMC computing architecture

MMC
customers

Enterprise
information

Knowledge
worker
information

MMC
suppliers

MMC
internal
processes
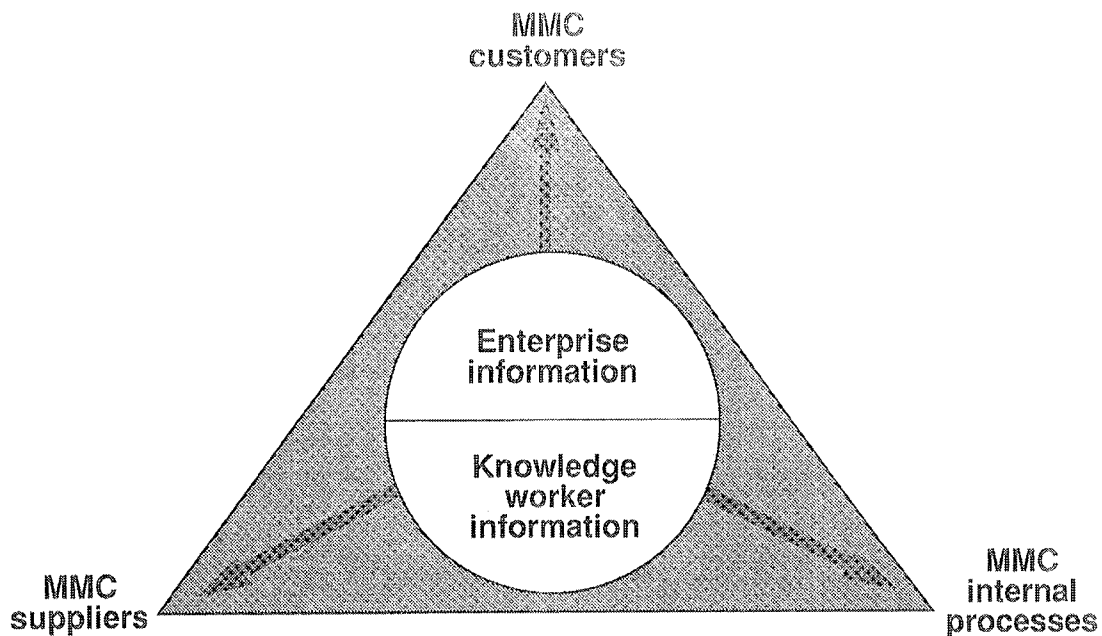
*Information management will be the
competitive advantage of the future*

Eicher/941214/*/10

Technical architecture vision

Tier 1
Presentation

Tier 2
Functionality

Tier 3
Data/Legacy

UNIX

Windows

Macintosh

Application Functionality Server	Connectivity Server
Security Server	Database Server
	Distributed Management Services
Cell Directory Services	Distributed Time Services

Legacy system

DBMS

New data
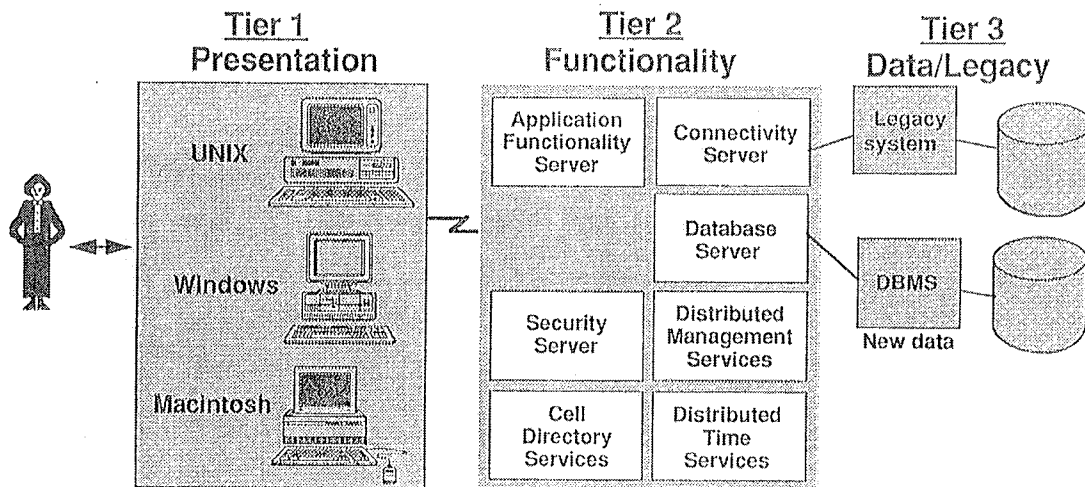
Advantages of
client/server:

- Faster development
- Increasing availability of COTS products
- Platform independence
- Build on investment in legacy systems
- Moves data closer to user

LM-Cleveland/941129/*/18

228

An approach for developing application systems

Accelerated Application Engineering Process

Overview

Tactical Information Planning

Analysis Prototyping

Construction / Continuous Testing

Integration/Implementation
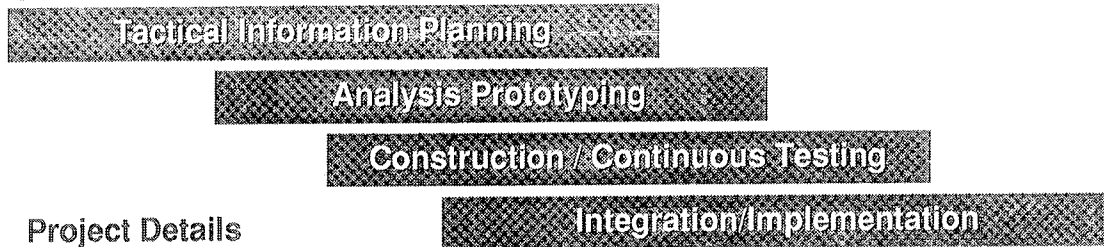
Project Details

TIP
Requirements
Ops Concept
Decomposition

TIP	AP	C/CT	I/I			
TIP	AP	C/CT	I/I		
TIP	AP	C/CT	I/I	
TIP	AP	C/CT	I/I
TIP	AP	C/CT	I/I

I/I
Final Test
Deployment
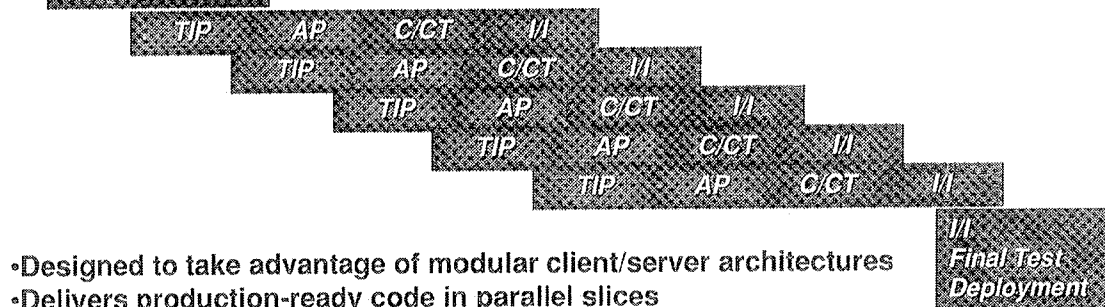
- Designed to take advantage of modular client/server architectures
- Delivers production-ready code in parallel slices

Eicher/941214/ /20

229

GTE Enterprise Integration
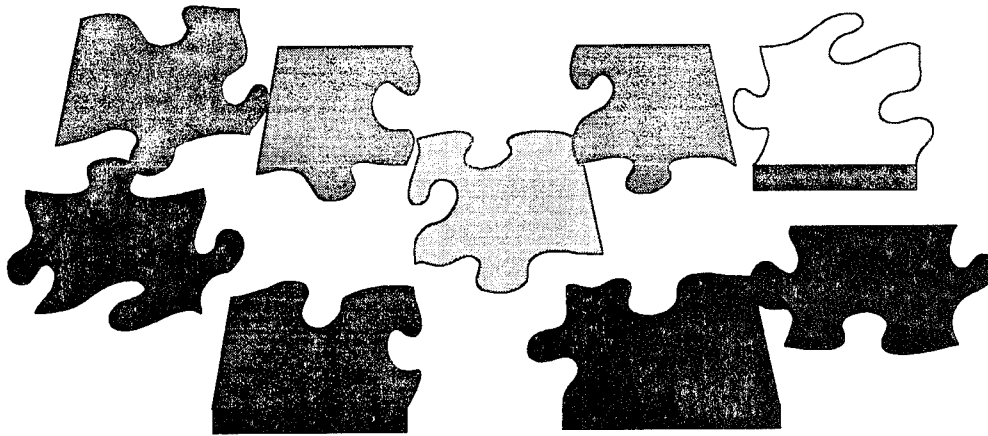
Putting the Pieces Together
the **Right Way!**

Frank Gicca - GTE

The Problems

GTE

■ **Revolution (client-server/common data) Difficult**
  - Too expensive - Legacy and new systems must co-exist for awhile

■ **Any Change is Viewed Negatively**
  - Some try to "wait it out", others fear it, few understand it

■ **Many Fail to Re-engineer the Process and Functions**
  - Traditional efforts focus on applications and systems

■ **Data still not Universally Available**
  - Political, ownership, definition, normalization, and access issues

■ **Network and Telcom Requirements Often Ignored**
  - Results in poorly designed solutions

■ **Evolution *versus* Revolution**
  - What alternatives are available?

What it takes to do it Right

GTE

■ **Know what the Puzzle is Supposed to Look Like**
  - Create the new reality: a value-added environment

■ **Deal with Change Aggressively**
  - Create the Crisis and make the changes happen fast

■ **Form the Right Implementation Team**
  - Led by VP, but cross functional to enhance original thinking

■ **Chart the Course**
  - Make a detailed plan and schedule - and follow it

■ **Implement, Don't Study to Death**
  - Analysis paralysis is fatal

■ **Install the Information Technology Base First**
  - Must have the base to help "force" the changes

■ **Migrate, Don't Leap *(Evolution)***
  - Take it small bites
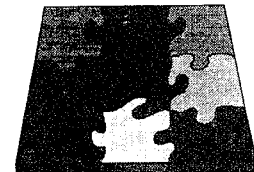
GTE How We Implemented the Plan

- **Established Exec. Group to shape Enterprise Goals**
  - Commitment to customers was paramount
  - Long Range plan created
- **Reward System Implemented**
  - Incentivized business units by giving them percentage of savings
- **Technical Infrastructure Needs Identified**
  - Ensured that environment would be available to support changes
- **Re-Engineered Applications with CASE Tool**
  - To reduce development time and maintenance costs
- **Created a Phased Approach**
  - Each Phase monitored and "managed" by senior management

GTE Lessons Learned

- **Champions Must be Committed**
  - Top level involvement essential
- **Identify the Compelling Case for Action**
  - Create a Crisis atmosphere...SELL IT!
- **Use Outside Resources to Ensure Objectivity**
  - Consultants can also help break logjams
- **Choose the "Value-Added" Path**
  - But attach <u>no blame</u> for the existing process
- **Involve the Customer and Front-Line People**
  - Shift to "Outside-In" thinking - Look at processes as a customer
- **Install the New Information System <u>First</u>**
  - Verify it works, then implement organizational changes
- **Stimulate Innovation**
 - Through rewards and "Best Practice" discovery

GTE More Lessons Learned

- **Maintain a Sense of Urgency**
  - Change is essential for survival - be biased toward action
- **Adherence to the Long Range Plan Essential**
  - Define "architecture" early - follow the road map
- **Centralize only where Necessary**
  - Empowered employees is the key to success
- **Watch out for Rice Bowls !**
  - Use bottom up justification and force proof of value added
- **Modeling and Metrics Essential**
  - To ensure correct technology is used
- **Accept Something Less than Perfection**
  - Must continue forward momentum - EVOLVE
- **Communicate!.... Communicate!.... Communicate!**

GTE Summary

- **Enterprise Integration _Can_ be done the _Right Way_!**
- **Significant savings are possible**
  - Investment essential to success (Corporate "seed money")
  - GTE started 5 years ago - _there is no instant success_
- **Requires:**
  - Commitment at all levels
  - Detailed planning
  - Vision
  - A little bit of Luck
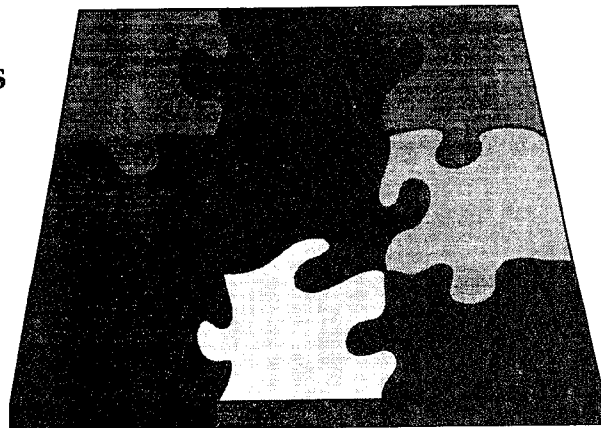
A Brief History of
Data Resource Management
at The Boeing Company

December 14, 1994

Dr. R. Peter Dube
Vice President, System Integration
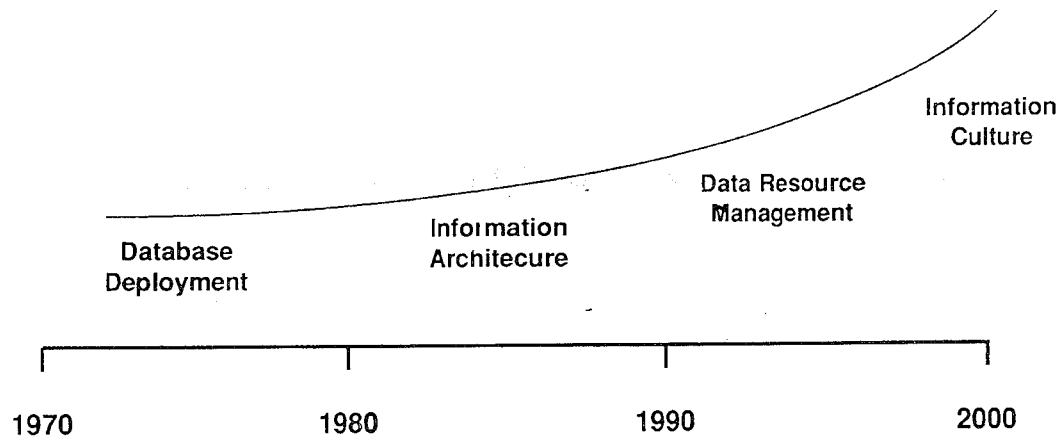Boeing Information Services

JFP.vepdrm.1
12/8/94 1:16 PM

A Brief History of DRM at Boeing

- Circa 1982
- Circa 1990
- Circa 1994

DRM at Boeing - A view in the year 2000

JFP.vepdrm.2
12/8/94 1:16 PM

An Historical View of Data Management

Information
Culture

Data Resource
Management

Information
Architecure

Database
Deployment

| 1970 | 1980 | 1990 | 2000 |

JFP.vepdrm.8
12/8/94 1:16 PM

- ## DRM at Boeing - Projected view in the year 2000

    - Data viewed as a critical asset of the enterprise
    - Autonomy at the individual business units with a recognition that their future is tied to data interoperability with their partners, suppliers, and customers
    - Data Resource Management viewed as an integral business process within the enterprise
    - Emphasis on continued evolution of the process, technology, methodology, and standards; i.e., close marriage of basic CQI and DRM principles
    - <u>Bottom line: Recognize DRM as a cultural issue</u>

JFP.vepdrm.6
12/8/94 1:16 PM

- **Architecture implications for the future**
  - Decision support data should be separated from operational data for improved performance and functionality
  - Definition data should provide data models for a subject area
  - Product, process, and methods data should be managed together in a distributed subject area repository
  - Data replication services needed to reduce waste and increase quality of data
  - Data storage and archival hierarchy needed to reduce costs
  - Development of information systems need to include data to support
    - » Common multimedia user interface
    - » System specifications that drive flexible implementation
    - » System implementations that provide just-in-time functionality at reasonable cost and good performance
    - » System support features that reduce maintenance costs and improve quality

JFP.vepdrm.9
12/8/94 1:16 PM

Architecture, Technology & Standards

- **Standards implications for the future**
  - Data manipulation relational language are very mature (SQL)
  - Object data management standards very immature (OMG)
  - Data modeling language standards are emerging slowly (IDEF)
  - Data interchange standards are emerging slowly (SGML, PDES/STEP)
  - Data definition interchange emerging slowly (CDIF)
  - Data repository standards very slow in development (IRDS, PCTE)
  - Remote database access progressing rapidly (RDA)

JFP.vepdrm.11
12/8/94 1:16 PM

- Technology implications for the future
    - Client/server, distributed, multimedia data management will need a breakthrough in technical and administrative infrastructure
    - Object-oriented databases for advanced applications will require heavy pilot activity but payoff potential is large
    - Repository technology needs a great deal more work to support object-oriented and distributed requirements
    - Long-term product and process data retention is a major technological challenge
    - Data interchange and data modeling technologies are key to providing the required infrastructure

JFP.vepdrm.10
12/8/94 1:16 PM